

Docket No. 50-354

JUN 21 1985

MEMORANDUM TO: Central Files

FROM: Walter R. Butler, Chief
Licensing Branch No. 2
Division of Licensing

SUBJECT: HOPE CREEK INDEPENDENT DESIGN VERIFICATION PROGRAM (IDVP)

Public Service Electric & Gas Company has contracted Sargent & Lundy to perform an IDVP of Hope Creek. Bechtel is the architect-engineer for Hope Creek. The following correspondence (enclosed) has been generated by the IDVP efforts:

- Enclosure 1 Bechtel Resolution Reports for Observation Reports 1 through 25, 27 through 38, 41 through 44, 46 and 47
- Enclosure 2 Observation Reports 49, 51 through 60
- Enclosure 3 Observation Reports 61 through 65
- Enclosure 4 Observation Reports 66 through 72

Additional correspondence was included in a June 10, 1985 memorandum from W. Butler to Central Files.

Original signed by:

Walter R. Butler, Chief
Licensing Branch No. 2
Division of Licensing

Enclosures:
As stated

DISTRIBUTION

Docket File

LB#2 Reading

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EHylton

- HWang, QAB

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LB#2/DL/PM
DWagner:lb
06/18/85

LB#2/DL/PM
WButler
06/18/85

8507030553 850621
PDR ADDCK 05000354
A PDR



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

JUN 21 1985

Docket No. 50-354

MEMORANDUM TO: Central Files

FROM: Walter R. Butler, Chief
Licensing Branch No. 2
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1 through 25, 27 through 38, 41 through 44, 46 and 47
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- Enclosure 4 Observation Reports 66 through 72

Additional correspondence was included in a June 10, 1985 memorandum from W. Butler to Central Files.

W. R. Butler
Walter R. Butler, Chief
Licensing Branch No. 2
Division of Licensing

Enclosures:
As stated

J. Milhoan

*E. Imbro**Wang*

PDR

**SARGENT & LUNDY
ENGINEERS**

FOUNDED 1891

55 EAST MONROE STREET

CHICAGO, ILLINOIS 60603

(312) 269-2000

TWX 910-221-2607

H. STEPHEN TAYLOR
ASSOCIATE
312-269-6371LSP-55
June 11, 1985
Project No. 7212-30Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1Independent Design Verification Program
Resolution/Completion ReportsMr. W. F. Bauer
Principal Engineer
Public Service Electric and Gas Company
80 Park Plaza
Newark, New Jersey 07101

Dear Mr. Bauer:

In accordance with my telephone conversation of June 10, 1985 with Mr. W. Gailey of PSE&G and Mr. J. Milhoan of the NRC, I am sending, by copy of this letter, one copy each of Bechtel Resolution Reports for Observation Reports 1 through 25, 27 through 38, 41 through 44, 46 and 47 to Mr. J. Milhoan of the Nuclear Regulatory Commission. Also, enclosed in Mr. Milhoan's copy of this letter is one copy of the Meeting Notes transmitted with LSP-46.

If you have any questions, please call me.

Yours very truly,

*H. S. Taylor*H. S. Taylor
Chairman, Internal Review CommitteeHST:nd
Enclosures
Copies to:
W. Gailey (1/0)
Y. J. Yaworsky (1/0)
J. Milhoan (1/1)
W. A. Bloss (1/0)

SARGENT & LUNDY
ENGINEERS
FOUNDED 1891

W. A. BLOSS
ASSOCIATE
312 269-7044

88 EAST MONROE STREET
CHICAGO, ILLINOIS 60603
(312) 269-2000

LSP-46
May 31, 1985
Project No. 7212-30

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Notes of Meeting
Hope Creek Independent Design
Verification Program
Technical Items Protocol 3

Mr. W. F. Bauer
Principal Engineer
Public Service Electric
and Gas Company
80 Park Plaza
Newark, New Jersey 07101

Dear Mr. Bauer:

Enclosed are the notes of meeting which was held in the offices
of Sargent & Lundy May 29, 1985 to discuss Hope Creek Independent
Design Verification Program (IDVP) technical items Protocol 3.

If you have any questions, please call me.

Yours very truly,

W. A. Bloss / Terry Brandys
W. A. Bloss
Project Manager

WAB:tb

Enclosures - All Recipients

Copies to:

W. Gailey
Y. J. Yaworsky
J. Milhoan
P. L. Wattelet
H. S. Taylor
O. Zaben

W. D. Crumpacker
T. J. Duffy
H. G. McCullough
R. M. Schiavoni
D. P. White

SARGENT & LUNDY
ENGINEERS
CHICAGO

Project No. 7212-30

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Notes of Meeting - May 29, 1985
Sargent & Lundy Offices
Hope Creek Independent Design
Verification Program
Technical Items - Protocol Category 3

THOSE PRESENT:

W. F. Bauer)	Public Service Electric
W. Gailey)	and Gas Company (PSE&G)
P. L. Wattlelet)	Sargent & Lundy (S&L)
W. A. Bloss)	
*H. S. Taylor)	

*Part Time

1. Purpose

The purpose of the meeting was to discuss S&L's Observation Report (OR) Number 29 for the purpose of providing PSE&G personnel with additional information to allow a full understanding of the observation and its basis. This meeting was held under Paragraph 3 of the Protocol which requires documentation of the discussion with submittal to the Nuclear Regulatory Commission (NRC) in a timely manner.

2. Discussion and Action Items

- 2.1 Bechtel Power Corporation (BPC) questioned the reference made to OR's 15, 16, 17, 18, 20 and 29 on page 2 of OR-29 (see attachment). S&L explained that the above references should have been made to OR's 25, 26, 27 and 28. S&L will correct OR-29 and issue revision 1.

ACTION:

S&L)

Complete by 6/4/85.

- 2.2 PSE&G questioned S&L's philosophy on issuing several OR's and then issuing a final generic OR referencing the previous ones. S&L explained that as subsequent OR's were generated on the same design specification, it became apparent that the design specification was out of date in general. Hence, a large number of additional OR's could have been generated on specific inconsistencies throughout the document. Rather than continue to generate OR's on the same document, S&L

May 30, 1985

Notes of Meeting
May 29, 1985

determined that it was more appropriate to write one generic OR pertaining to the entire document. It was agreed that this was a reasonable process to follow for this particular OR and for similar OR's should they be necessary in the future.

W. A. Bloss/Terry Brandys
W. A. Bloss

WAB:tb
Attachment
Copies to:
W. F. Bauer (1)
J. Milhoan (1)
W. A. Chittenden (1)
W. G. Hegener (1)
E. V. Abraham (3)
R. X. French (1)
G. C. Kuhlman (1)
J. M. McLaughlin (5)
P. L. Wattlelet (1)
R. J. Pruski (1)
H. S. Taylor (1)
O. Zaben (1)
W. D. Crumpacker (1)
T. J. Duffy (1)
H. G. McCullough (1)
R. M. Schiavoni (1)
D. P. White (1)
All Meeting Attendees (1)

OBSERVATION REPORT

OR No. 29, Rev. 0, Date 5/21/85

1. Structure(s), system(s), or component(s) involved:
Bechtel Design Specification 10855-M-068(Q), Rev. 1, for
Nuclear Power Piping, ASME-III, Class 2 and 3 (1/31/79)
2. Description of Observation:
FSAR Section 3.2 commits to ASME Section III. Section III,
NA-4410, Design Controls, requires stress reports to be
reviewed for compliance with Design Specifications.
3. Significance of Observation: (continued on next page)
There is a possibility that stress reports and other design
documents may be incorrect because the applicable Design
Specification is apparently out-of-date. There is a
(continued on next page)
4. Recommendation for resolution (optional):
a. Bechtel should re-review and revise the Design Specification
to bring it up-to-date.
Provide assurance that the stress reports and the overall
design is compatible with the new revision. (continued on next page)
5. Internal Review Committee classification of Observation:
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. Internal Review Committee reason for non-safety-significance of
Observation or additional information required:
Additional information is required to evaluate safety significance
Provide information requested in Item 4.
7. Internal Review Committee
Signatures:
H. S. Taylor / by A. M. M.
Chairman
[Signature]
Mechanical Representative
[Signature]
Structural Representative
[Signature]
Electrical Representative
[Signature]
Control and Instrumentation
Representative

OBSERVATION REPORT

OR No. 29, Rev. 0, Date 5/21/85

2. Description of Observation: (continuation)

Several OR's have identified apparent deficiencies in the Design Specification (ORs 15, 16, 17, 18, 20 and 29). Therefore, it is not apparent how the required reviews of stress reports have been accomplished with the design specification containing numerous inconsistencies.

3. Significance of Observation: (continuation)

possibility that the QA requirements of ASME Section III, may not be met.

4. Recommendation for Resolution (optional): (continuation)

- b. Bechtel should identify the failure in the design process that resulted in this observation and how it will be corrected.
- c. Describe the process that assures that Design Specifications are kept current with design requirements.
- d. Bechtel should provide assurance that the observation is an isolated occurrence and that all other ASME III Design Specifications have been updated on a timely basis.

MAY 14 '85 1282635

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 1 of 2

RESOLUTION/COMPLETION REPORT

OR No. 1 Rev. 0 Date 5-7-85
R/CR No. 1 Rev. 0 Date 5-13-85

1. Classification of Observation (by S&L):
☐ Not significant to safety
☐ Significant to safety
☒ Additional Information required

2. Reviewee proposed resolution:

See sheet 2

3. Reviewee resolution report by:

[Signature]
Discipline Group Supervisor

Date 5-10-85

[Signature]
Project Engineer

Date 5/13/85

4. Public Service Electric and Gas Company review:

[Signature]
Chief Project Engineer

Date 5/14/85

5. S&L's disposition of Resolution/Completion Report:
☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable, observation closed.
☐ Additional action to be taken by Reviewee (provide additional information).

6. Final classification of observation by Review Committee:
☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 1 Rev. 0 Date 5-7-85
R/CR No. 0 Rev. 1 Date 5-13-85

REVIEWEE PROPOSED RESOLUTION

The observation references EDP4.36 as the basis for requiring a theoretical manual for the SLAP program. The referenced EDP applies to Standard Computer Programs (SCP's) which are defined as "programs which are verified, documented and controlled in accordance with this procedure, and may be used without detailed description and verification in the calculation package." The SLAP program does not satisfy this definition and is not considered a SCP. Therefore, EDP4.36 does not apply.

However, EDP4.37, Design Calculations, does apply to the use of computer programs other than SCP's. Specifically, Paragraph 3.0e states in part:

"Computer calculations, other than those utilizing a Standard Computer Program (SCP), as defined in the EDP entitled "Standard Computer Programs", shall contain the inputs and outputs and, by reference or inclusion, a description of the program including program option used, if appropriate, identification of computer type used and a sample calculation which demonstrates verification of the program.

To satisfy the intent of this paragraph an independent verification check was performed as part of Civil calculation 621-29(Q) (previously furnished). This verification compares the results of hand calculations with those of the program's for 6 independent cases. The results of the 2 methods compare very closely. Omitted from the calculation is a description of the program or reference to the descriptive information. To prevent future misinterpretations, calculation 621-29(Q) will be revised to provide reference to descriptive information on the SLAP program including the computer type used and indicate that is not a SCP. The revised calculation will be submitted by May 17, 1985.

Regarding the second portion of the recommendation for resolution, all Bechtel Standard Computer Programs governed by EDP-4.36 do have theoretical manuals as well as user's manuals and verification reports.

MAY 22 '85 0283017

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
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RESOLUTION/COMPLETION REPORT

OR No. 2 Rev. 0 Date 5/13/85
R/CR No. 2 Rev. 0 Date 5/21/85

1. Classification of Observation (by S&L):

X Not significant to safety
 Significant to safety
 Additional Information required

2. Reviewee proposed resolution:

See sheet 2

3. Reviewee resolution report by:

[Signature]
Discipline Group Supervisor

5/21/85
Date

[Signature]
Bechtel Project Engineer

5/1/85
Date

4. Public Service Electric and Gas Company Review:

[Signature]
Chief Project Engineer

5/20/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
observation closed.
 Additional Action to be taken by Reviewee (provide
additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

MAY 22 '85 0283017

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 3

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 2 Rev. 0 Date 5/13/85
R/CR No. 2 Rev. 0 Date

REVIEWEE PROPOSED RESOLUTION

1. Logic diagram J-11-0, sheet 16, revision 5, dated 4/18/83 illustrates the control logic for the interlock between valve HV-2520B and RHR pump B. This drawing shows that the interlock is being originated at the 52 contact in switchgear A402 which supplies power to RHR pump B. The title for this logic appropriately reflects RHR pump BP202 as the interlocked pump. The drafting error identified on attachment 1 and described in observation report 2 in itself could not have had any effect on the design. Schematic E-0219-0 confirms that the valve is correctly interlocked to RHR pump B.

In view of the above, the subject observation is a drafting error.

Drawing J-11-0, sheet 16, will be revised as reflected on attachment 1.

2. Drawing J-11-0, sheet 16, shows control logics for RHR Heat Exchanger BE205 outlet valve HV-2512B and RHR pump seal and motor bearing cooling water supply valves HV-2520A, B, C & D. The electrical schematic for valve HV 2512B is shown on drawing E-0223-0. The electric schematic for valves HV-2520A, B, C & D is shown on drawing E-0219-0.

Table on drawing J-11-0, sheet 1, references schematic E-0223-0 against sheet 16. Scheme E-0219 is not referenced in the tabulation.

Drawing J-11-0, sheet 1, will be revised to add reference to schematic E-0219-0 for circuits 19, 20, 21 and 22, and schematic E-0223-0 for circuit 28. The references to electrical schematics and vendor schematics on the cover sheet are provided as an aid to the users of the logic drawings and are not used in developing the design. Therefore, there should be no design consequences if incorrect or incomplete references to electrical schematics are made.

3. The methodology with which the design documents are developed, and design is consistently and correctly incorporated, is in compliance with the Bechtel Engineering Department Procedures.

MAY 22 '85 1293017

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 3 of 3

RESOLUTION/COMPLETION REPORT
(Continuation Sheet)

OR No. 2
R/CR No. 2

Rev. 0
Rev. 0

Date: 5/13/85
Date: _____

Design of electrical schematics is developed from the logic diagrams. Schematic E-0219-0 correctly references drawing J-11-0, sheet 16. The initial issue of logic diagram does not reference any electrical schemes. The electrical schematics are referenced on logic diagrams at subsequent revisions. The purpose of specifying electrical schematics on logics is for information only.

Design drawings are coordinated between various disciplines (Mechanical, Control System, Electrical, Civil, etc.) for their review before the drawings are issued for construction. Any inconsistency in the design reflected on drawings is normally detected and corrected during the review process.

In view of the above, we feel that the concerns raised due to the subject observation do not reflect any deficiency in the design input methodology of document development.

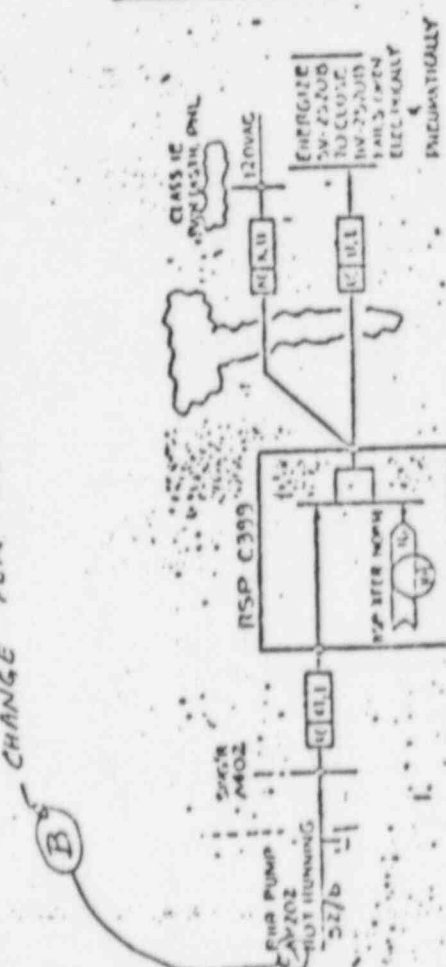
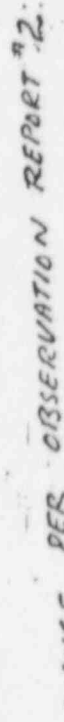
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Project 10855-013

OR No. 2
R/CR No. 2

Rev. 0
Rev. 0

Date 5/13/85
Date 5/21/85

[illegible]

OUR OWNERS EMOTOR F&G WTR SUPPLY V IV-25200

CROSS REFERENCE TABLE

CROSS REFERENCE TABLE						
PUMP NO.	SWICH NO.	SEQUENCE	COIL WATER TEMPERATURE	COIL HE TEMPERATURE	TC	COIL OIL TEMPERATURE
AP202	A 201	SV-2520A	WF-2520A	A 200	AC657	13
CP202	A 203	SV-2520C	WF-2520C	C 200	CC657	21
BP202	A 204	SV-2520D	WF-2520D	D 200	DC657	22

57-915

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 1 of 3

RESOLUTION/COMPLETION REPORT

OR No. 3

Rev. 0

Date 5/13/85

R/CR No. 3

Rev. 0

Date 5/22/85

1. Classification of Observation (by S&L):

- ☐ Not significant to safety
☐ Significant to safety
☒ Additional Information required

2. Reviewee proposed resolution:

See Sheet 2

3. Reviewee resolution report by:

D. J. Graw BCF
Discipline Group Supervisor

May 22, 1985
Date

KB/MDP
Bechtel Project Engineer

5/22/85
Date

4. Public Service Electric and Gas Company review:

W. G. Graw
Chief Project Engineer

5/22/85
Date

5. S&L's disposition of Resolution/Completion Report:

- ☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable, observation closed.
☐ Additional action to be taken by Reviewee (provide additional information).

6. Final classification of observation by Review Committee:

- ☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 3

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 3 Rev. 0 Date 5/13/85
R/CR No. 3 Rev. 0 Date 5/22/85

A. The discrepancy in wall thickness noted in OR-3, Rev.0, dated 5/13/85 was noted by the analyst but was not documented per our procedure. The rationale for accepting the discrepancy without documentation was the inherent conservatism in the value of SIF used for the elbow. (SIF of 11.446 was used instead of 7.47. This is documented in Calc.C1750-3(Q) under your review.) It was the judgement of the analyst that use of proper wall thickness will:

- a) Improve thermal flexibility of the system and help reduce stress at the elbow.
- b) Flexibility effect on seismic analysis will be compensated by the reduced SIF of the elbow.

In addition to that, the mass used in the piping mathematical model was based on wall thickness = 0.375, thereby reducing the probability for impact due to load changes.

It was analyst's judgement that reduced wall thickness could result in higher seismic stresses at the anchor. However, due to low stresses in the existing pipe model, the increase in stress was judged not to cause any problem in meeting code allowables.

B. In order to maintain design control and also to avoid unnecessary revisions to completed calculations, certain practices are put into place on the project to provide such control. The control is put into effect through any of the following practices:

- a) Regular routing of FCRs/FCNs/SDDRs within the stress group so that the individual analyst can assess the impact on calculation and document it either on hanger guidance isometric or if necessary on discrepancy sheet.
- b) Any hanger relocation request by pipe support group during design or installation phase of the project is coordinated with the stress group. "Request for relocation/..." form (see Att.5 of Appendix P of Stress Group Procedure for Stress Analysis). Such relocation requests are filed with appropriate calculation and incorporated in next revision of the calculation. This ensures that changes identified on the calculation will not be missed during future revision of the calculations.
- c) Prior to issuance of any change in system isometric, the isometric is coordinated and signed by stress analyst providing added assurance that the change made to system isometric has been looked into by the stress analyst.

MAY 22 '85 0293017

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 3 of 3

RESOLUTION/COMPLETION REPORT

OR No. 3 Rev. 0 Date 5/13/85
R/CR No. 3 Rev. 0 Date 5/22/85

- d) The use of discrepancy form (Appendix S of Stress Group Procedure for Stress Analysis) is used to document engineering evaluation of a change (brought about by FCRs/FCNs/valve changes/SDDRs, etc.) that affects the completed calculation. The discrepancy sheet is affixed to the calculation folder with all supporting documents and any computer runs identified so that the discrepancy can be formally included in next revision of calculation.
- e) During as-built reconciliation of the piping system, the analyst goes through a checklist (Appendix L) of the As-Built Reconciliation Procedure, wherein parameters important to stress analysis are checked and verified as current by the analyst.

MAY 22 '85 0235017

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 1 of 3

RESOLUTION/COMPLETION REPORT

OR No. 4
R/CR No. 4

Rev. 0 Date 5/13/85
Rev. 0 Date 5/22/85

1. Classification of Observation (by S&L):

- ☐ Not significant to safety
☐ Significant to safety
☒ Additional Information required

2. Reviewee proposed resolution:

See Sheet 2

3. Reviewee resolution report by:

Dr. J. M. [Signature]
Discipline Group Supervisor

May 22, 1985
Date

KB/ [Signature]
Bechtel Project Engineer

5/22/85
Date

4. Public Service Electric and Gas Company review:

W. [Signature]
Chief Project Engineer

5/27/85
Date

5. S&L's disposition of Resolution/Completion Report:

- ☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable,
observation closed.
☐ Additional action to be taken by Reviewee (provide
additional information).

6. Final classification of observation by Review Committee:

- ☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 3

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 4 Rev. 0 Date 5/13/85
R/CR No. 4 Rev. 0 Date 5/22/85

A. The discrepancy in modelling described in Section 2.0 of this observation report OR-4, Rev.0, dated 5/13/85 was identified by one of the Bechtel analysts during routine hanger review and approval process on 4/9/84. This discrepancy was noted in the input image for the affected calculation C1750-3(Q) and appropriately signed and dated by the analyst. Also, based on our procedure described in stress group procedures, this discrepancy was documented on the discrepancy sheet and engineering justification provided on the discrepancy sheet.

Based on the existing pipe stress and restraint design, it was judged by the analyst that the discrepancy will have insignificant effect on the overall results. Also, a recommendation was made to include this discrepancy during as-built reconciliation. A copy of this discrepancy sheet has already been sent to you per your request in TSB 58.

B. In order to maintain design control and also to avoid unnecessary revisions to completed calculations, certain practices are put in place on the project to provide such control. The control is put into effect through any of the following practices:

- a) regular routing of FCRs/FCNs/SDDRs within the stress group so that the individual analyst can assess the impact on calculation and document it either on hanger guidance isometric or if necessary on a discrepancy sheet.
- b) Any hanger relocation request by pipe support group during design or installation phase of the project is coordinated with the stress group. "Request for relocation/...." form (see Att.5 of Appendix P of Stress Group Procedure for Stress Analysis). Such relocation requests are filed with appropriate calculation and incorporated in next revision of the calculation. This ensures that changes identified on the calculation will not be missed during future revision of the calculations.
- c) Prior to issuance of any change in system isometric, the isometric is coordinated and signed by stress analyst providing added assurance that the change made to system isometric has been looked into by the stress analyst.
- d) The use of discrepancy form (Appendix S of Stress Group Procedure for Stress Analysis) is used to document engineering evaluation of a change (brought about by FCRs/FCNs/valve changes/SDDRs, etc.) that affects the completed calculation. The discrepancy sheet is affixed to the calculation folder with all supporting documents and any computer runs identified so that the discrepancy can be formally included in next revision of calculation.

MAY 22 '85 0283017

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 3 of 3

RESOLUTION/COMPLETION REPORT
(Continuation Sheet)

OR No. 4
R/RC No. 4

Rev. 0
Rev. 0

Date 5/13/85
Date 5/22/85

- e) During as-built reconciliation of the piping system, the analyst goes through a checklist (Appendix L) of the As-Built Reconciliation Procedure, wherein parameters important to stress analysis are checked and verified as current by the analyst.

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

MAY 22 '85 0283017
Project No. 10855-013
Page 1 of 2

RESOLUTION/COMPLETION REPORT

OR.No. 5
R/CR No. 5

Rev. 0 Date 5/13/85
Rev. 0 Date 5/22/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

CB/HB *Robert Henderson*
Discipline Group Supervisor

5/22/85
Date

KB/JS *KB/JS*
Bechtel Project Engineer

5/22/85
Date

4. Public Service Electric and Gas Company review:

W. G. Smith *W. G. Smith*
Chief Project Engineer

5/22/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

MAY 22 '85 0283017

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 5 Rev. 0 Date 5/13/85
R/CR No. 5 Rev. 0 Date 5/22/85

The wall thickness calculations performed on the project are based on design pressure using S_m as the allowable. By increasing the design pressure (P_D) by 25%, as mentioned in Section 7.0 of the specification, calculated general membrane stresses will always be less than $0.9S_y$ (hydrostatic test stress limits defined in NB 3226(a))

In equation form:

$$P_D \leq S_m$$

$$1.25 P_D \leq 0.9S_y = 0.9 (1.5S_m) = 1.35 S_m$$

From the above it is evident that for a 25% increase in design pressure, the allowable limit is raised by 35%.

In addition to the above, the primary and bending stresses are calculated based on allowable of $1.5S_m$. Increasing the design pressure by 25%, the calculated primary and bending stresses will always be less than $1.35S_y$ (hydrostatic test stress limits defined in NB 3226(b)).

In equation form:

$$P_D + M \leq 1.5S_m$$

$$1.25P_D + M \leq 1.35S_y = 1.35 (1.5S_m)$$

$$= 2.03S_m$$

Where M = stress due to moment term in equation (9) NB-3652

From the above it is evident that for 25% increase in design pressure, the allowable limit is raised by 35%. Primary stress index B_1 is always ≤ 1.0

Similar conclusions can be drawn by increasing design pressure by 33%.

Because of the above code required calculation, the code stress limit for the hydrostatic case is automatically met. Therefore, a separate calculation for hydrostatic condition is redundant and need not be performed separately.

Table 6.2-1 of the HPCI stress report clearly demonstrates that the code stress limits for the hydrostatic testing case have been met.

Based on the above discussions, we do not see need for revising the specification since the requirements of the Code have been appropriately considered and met in our stress reports.

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RESOLUTION/COMPLETION REPORT

OR No. 6 Rev. 0 Date 5/13/85
R/CR No. 6 Rev. 0 Date 5/20/85

1. Classification of Observation (by S&L):

- X Not significant to safety
 Significant to safety
 Additional Information required

2. Reviewee proposed resolution:

See sheet 2.

3. Reviewee resolution report by:

S. Shrivastava
Discipline Group Supervisor

5/21/85
Date

P. B. / JDR
Bechtel Project Engineer

5/21/85
Date

4. Public Service Electric and Gas Company review:

M. G. / JDR
Chief Project Engineer

5/21/85
Date

5. S&L's disposition of Resolution/Completion Report:

- Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

- Not significant to safety
 Significant to safety

7. Review Committee signatures:

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OR No. 6 Rev. 0 Date 5/13/85
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Observation 6

1. Regarding the elevation of the groundwater table, there is no inconsistency between the General Civil-Structural Design Criteria 10855-D2.1, Rev. 7 and the FSAR. In Section 3.4 of Design Criteria 10855.D2.1, the water table is given as 96 ft. (PSE&G datum) and is consistent with FSAR Section 2.4.13.5, entitled "Design Bases For Subsurface Hydrostatic Loading", which specifically states in part "...a maximum expected water table elevation of +96 PSE&G datum was considered a reasonable and conservative design base for hydrostatic loading."

It should be noted that FSAR Section 2.4.13.5 does reference FSAR Section 2.4.13.1, which indicated prior to dewatering operations and excavation "...the natural piezometric level of the Vincentown aquifer (about elevation +93 to +97 PSE&G datum)". FSAR Section 2.4.13.5 states the rationale for the design base groundwater elevation of +96 ft. PSE&G datum.

2. Concerning the inconsistency of the groundwater elevation of 95.5 ft. PSE&G datum used in Calculation 621-2(Q) to current FSAR and design Criteria groundwater elevation commitments of 96 ft., we have the following comments:

- a. The elevation 95.5 ft. was consistent with Rev. A to Design Criteria D2.1 used in early 1975 for this calculation.
- b. The change to elevation 96 ft. for the groundwater table was made in conjunction with revision O (dated 7/14/75) of the Design Criteria D2.1. It was determined at that time that this minor revision has no significant impact on the design adequacy of the reactor building basemat.
- c. All calculations prepared subsequent to revision O of Design Criteria D2.1 use the revised elevation for groundwater table.

3. In response to the BPC process for assuring consistency between design documents and FSAR commitments, we have the following comments:

- a. The FSAR was originally written using the available design criteria, technical specifications and DITS at the time as the technical baseline.
- b. Subsequent changes to the FSAR and corresponding changes to appropriate design documents are controlled in accordance with EDP-4.23, Rev.2 (SAR Change Control) and EDPI-4.23.1, Rev.2 (Hope Creek Generating Station SAR Change Control).

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RESOLUTION/COMPLETION REPORT

OR No. 7 Rev. 0 Date 5/18/85
R/CR No. 7 Rev. 0 Date 5/22/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

S. Stanachay
Discipline Group Supervisor

5/23/85
Date

KB/MSD
Bechtel Project Engineer

5/23/85
Date

4. Public Service Electric and Gas Company review:

KCP
W. Bailey
Chief Project Engineer

5/23/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

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Justification of the adequacy of the results of the reactor building basemat finite element analysis is made on a point-by-point review of the descriptions given in the OR item 2.

- a. The number of elements through the thickness of the basemat is only 3. This may not provide sufficiently accurate element stresses to obtain appropriate bending moments in the mat.

The purpose of the large finite element analysis was to determine the primary load paths of the reactor building in transferring seismic inertia loads and other major applied loads through the structure to the soil system. The results therefore provide a global distribution of these force systems within the structures and the resultant soil pressure distribution. A fourteen-foot thick mat was selected to ensure low bending and shear stresses and adequate factor of safety against flotation. This also provides a rigid mat giving a smooth soil bearing pressure distribution.

The 3-D solid elements used to model the basemat use a linear strain distribution as a basis of their formulation. Comparing the depth versus span ratio for consideration of deep beam bending theory (i.e. 14 feet deep by 45-foot span) in the design critical span between the pedestal and the cylindric wall, it is determined that the through thickness bending stresses are nearly linear and plane sections remain plane (Ref.1). Therefore, the three linear elements with stress calculated at the centroids and the top and bottom faces, i.e. seven locations through the thickness are considered sufficiently accurate.

- b. The method used to calculate the bending moments from the element stresses as given in calculation 621-15(Q) (Sheets 1&2) may not provide acceptable values as it does not account for the correct location of the stress in the element.

The stress distributions through the basemat obtained from the finite element analysis were evaluated to determine the design forces and the required reinforcing steel. These stress distributions were approximated by a linear distribution to facilitate computation. The finite element stress distribution deviated from the straight line distribution at locations near the neutral axis and, therefore, has minimal effect on the calculation of the design

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moments. A comparison was made of the moments using the two stress distributions for typical cases provided in Sheets 1 and 2 of Calc. No.621-15(Q), Rev.0. In all cases, the resulting rebar requirements using the non-linear stress distribution deviated less than 10% from the requirements obtained from the linear distribution.

In addition, cracked section design theory was conservatively used to determine the required steel. It was observed that in nearly all cases the resultant concrete tension was less than the modulus of rupture and that neglecting this tension provided considerably more conservatism than necessary to compensate for possible differences in determining the design moment using linear stress distribution.

- c. The plan size of elements is very large considering the variation of the bending moment in the mat. The limited number of element stresses may not provide an accurate moment distribution.

The global deflected shape of the basemat was reviewed. This shape compared well with a typical massive structure of similar proportions. Due to the small relative rigidities of the walls with respect to the massive basemat, concentrated forces and moments applied to the upper surface of the mat result in gradual primary steel stress gradients. Therefore, structural discontinuities and high stress gradients do not occur in the major basemat reinforcement. As a result, it was determined that a finer mesh basemat model is not necessary. The use of three linear strain solid elements through the depth is sufficient to adequately model the global behavior of this continuous type of structure as shown by the deflected shape.

In addition, the rebar was designed using cracked section methods, neglecting the concrete tensile stresses. This method is very conservative for this structure since the basemat concrete tensile stresses from the finite element model are nearly all below the modulus of rupture.

- d. The overturning moments for each wall system, calculated in pages 7-17 of Calculation No.621-8(Q) result in a net vertical load. The net load due to overturning moment should be zero. The calculation of the nodal forces does not account for the nodal tributary areas (i.e., nodal forces are the same and do not vary with the nodal tributary area).

The forces obtained from the seismic soil pressure distribution in this calculation are used as seismic load input to the equiv-

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OR No. 7 Rev. 0 Date 5/18/85
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alent static finite element model used for the design of the basemat. The magnitude of the overturning moments are determined from the soil pressure distribution using the following approximations:

- o The soil pressure distribution is assumed to be linear.
- o The neutral axis of the soil pressure is coincident with the center of rigidity of the upper wall systems.
- o The nodal point tributary areas are not used in calculating the loads at each node due to geometric similarity of the nodal areas.

The above approximation results in a net unbalanced vertical load. The effect of this unbalanced load on the overall mat design is insignificant due to the following:

- o The net unbalanced vertical load is less than 1% of the total applied vertical load.
- o The linear approximation of the seismic pressure distribution results in moments which are significantly greater than the moments obtained from integrating the seismic base pressure distribution. (The resultant moment applied to the basemat model is approximately 1.7 times the moment from N-S analysis and 2.2 times the moment from the E-W analysis.)
- o Therefore, the applied moments are conservative.

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R/CR No. 8 Rev. 0 Date 5/21/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

The self-weight of support type R-3 is 11.4lb, 7.6lb, and 3.8lb for S = 3ft, 2ft and 1ft respectively. The capacity of this support is governed by moment. For the worst case conditions, the increase in moment due to the self-weight of the support member is 6.8%, 2.7% and 0.8% respectively for S=3ft, 2ft and 1ft.

(continued on sheet 2)

3. Reviewee resolution report by:

S. Stuchey
Discipline Group Supervisor

5/21/85
Date

R. KB/MDR
Bechtel Project Engineer

5/21/85
Date

4. Public Service Electric and Gas Company review:

W. Bailey
Chief Project Engineer

5/21/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable, observation closed.
 Additional action to be taken by Reviewee (provide additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

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Hope Creek Generating Station - Unit 1

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Bechtel's review of calculation 677-38(Q), Rev.5, page 220, reveals that several conservative assumptions have been made for designing type R-3 support. It is estimated that these conservatisms result in design margins in excess of 20%, which more than accommodate the slight increase in the design bending moment when self-weight is considered. Therefore, this design is adequate and meets FSAR commitments.

This observation is not significant to safety.

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OR No. 9 Rev. 0 Date 5/13/85
R/CR No. 9 Rev. 0 Date 5/21/85

1. Classification of Observation (by S&L):

- ☐ Not significant to safety
☐ Significant to safety
☒ Additional Information required

2. Reviewee proposed resolution:

All 6" Ø conduits and associated supports are engineered at the home office. Each conduit run is evaluated using calculation 677-38(Q) as reference and exceptions, if any, are evaluated on a case-by-case basis.

(Continued on Sheet 2)

3. Reviewer resolution report by:

J. Brumachay
Discipline Group Supervisor

5/21/85
Date

KB/MORRIS
Bechtel Project Engineer

5/21/85
Date

4. Public Service Electric and Gas Company review:

W. Bailey
Chief Project Engineer

5/21/85
Date

5. S&L's disposition of Resolution/Completion Report:

- ☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable, observation closed.
☐ Additional action to be taken by Reviewee (provide additional information).

6. Final classification of observation by Review Committee:

- ☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

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Calculation 677-38(Q), Rev.5, pages 350-354, which calculates the allowable spans for 6" \emptyset conduits, is prepared based on an assumption that 6" \emptyset rigid steel conduit only occurs in the reactor building below El.132'-0" and in control radwaste area below El.124'-0". This was substantiated based on the EE580 computer list dated 3/4/84 which showed that all 6" \emptyset conduits are located below El.132'-0" for reactor building and below El.124'-0" for other buildings.

In order to respond to this observation, a current EE580 computer list (dated 5/15/85) showing as-built location of all 6" \emptyset conduits designed to date, is obtained. This list confirms that the original assumption (contained in pages 350-354 of Calc. 677-38(Q), Rev.5) is still valid. Therefore, the existing design is adequate.

However, to minimize potential for any future misinterpretation, Table C-1 on Sheet 3.20.25, Rev.2 of Drawing E-1406-0 (Q), Rev.44, will be revised and a note added indicating that the spans for 6 \emptyset conduits shown apply to elevations below 132'-0" for reactor building and elevations below 124'-0" for all other buildings. The spans for higher elevations shall be evaluated on a case-by-case basis.

This action will be completed by June 7, 1985

This observation is not significant to safety.

RESOLUTION/COMPLETION REPORT

OR No. 10
R/CR No. 10

Rev. 0
Rev. 0

Date 5/13/85
Date 5/22/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2

3. Reviewee resolution report by:

Robert Anderson
Discipline Group Supervisor

5/22/85
Date

KB/JDR
Bechtel Project Engineer

5/22/85
Date

4. Public Service Electric and Gas Company review:

W. G. Smith
Chief Project Engineer

5/22/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

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OR No. 10 Rev. 0 Date 5/13/85
R/CR No. 10 Rev. 0 Date 5/22/85

Paragraph 3.1 of the specification references both the Line Index and the GE process data sheets as sources of pressure/temp. data, but does not mandate the document to be used. For the purpose of class 1 analysis, the value of design pressure (P_D) is taken from Bechtel's line index. For the range of operating pressures to be considered during various operating conditions, neither line index or process data sheets are used. The pressure corresponding to each operating condition is listed in load histograms (Appendix A of Spec. M067) which are generated by Bechtel based on input from GE's Thermal cycle diagram and Nuclear Boiler System spec. Therefore, for Nuclear Class 1 piping, the pressure values are selected from the load histogram for each operating condition. These pressure values represent the pressure the piping system is going to experience during the whole plant life. These pressure values, as shown in load histogram have been appropriately considered in each operating condition and have met the corresponding service limits. This is consistent with the ASME Sec.III NB-3653 wherein range of operating pressure needs to be considered.

We believe that the above procedure ensures that proper pressures have been considered in the preparation of Class 1 stress reports. Hence revision of design specification is not necessary in our opinion.

RESOLUTION/COMPLETION REPORT

OR No. 11

Rev. 0

Date 5/13/85

R/CR No. 11

Rev. 0

Date 5/22/85

1. Classification of Observation (by S&L):

- ☐ Not significant to safety
☐ Significant to safety
☒ Additional Information required

2. Reviewee proposed resolution:

See Sheet 2

3. Reviewee resolution report by:

Robert W. Henderson
Discipline Group Supervisor

5/22/85
Date

KB/MDP
Bechtel Project Engineer

5/22/85
Date

4. Public Service Electric and Gas Company review:

W. G. Smith
Chief Project Engineer

5/22/85
Date

5. S&L's disposition of Resolution/Completion Report:

- ☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable,
observation closed.
☐ Additional action to be taken by Reviewee (provide
additional information).

6. Final classification of observation by Review Committee:

- ☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
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OR No. 11 Rev. 0 Date 5/13/85
R/CR No. 11 Rev. 0 Date 5/22/85

The load combinations and the definitions of loads in Spec.10855-M-067, Rev.2 are adequate and are consistent with FSAR definitions. It is Bechtel's position that the definitions for DBA, RVC and RVO are adequate for design purposes. The only effect considered in DBA for piping analysis is the effect of Annulus Pressurization (AP). There are no other loads defined as DBA in Class 1 piping analysis. This is consistent with the treatment of load combination in our stress report Table 6.2-1 where DBA is identified as annulus pressurization effects only.

Table 6.2-1 in the HPCI stress report shows that the loading combinations used are consistent with FSAR and design specification requirements.

BEC-2/14

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OR No. 12 Rev. 0 Date 5/13/85
R/CR No. 12 Rev. 0 Date 5/22/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

Robert W. Henderson
Discipline Group Supervisor,

5/22/85
Date

KB/MDP
Bechtel Project Engineer

5/22/85
Date

4. Public Service Electric and Gas Company review:

W. F. ...
Chief Project Engineer

5/22/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

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OR No. 12 Rev. 0 Date 5/13/85
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The requirement for meeting the functional capability was stated in the Design Specification 10855-M-067, Rev.2, as footnote 3. Accordingly, Nuclear Group had identified on a set of P&IDs all the essential piping in the plant for which functional capability calculations need to be performed (see Appendix N of the Stress Group Procedure for Stress Analysis). Plant Design based on commitment made in FSAR to NEDO-21985 has used this GE topical report to perform functional capability calculations for all essential nuclear class 1 piping system. For your verification of our compliance with the commitment made in FSAR, we refer you to Appendix E of the HPCI Stress Report provided to you, which has the documentation for verifying compliance with NEDO-21985. In addition to that, the requirement for meeting functional capability has been appropriately noted on histograms for all systems requiring such evaluation. The Design Specification will be revised to reflect the commitment to NEDO-21985.

RESOLUTION/COMPLETION REPORT

OR. No. 13 Rev. 0 Date 5/13/85
R/CR No. 13 Rev. 0 Date 5/22/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

Robert W. Henderson
Discipline Group Supervisor

5/22/85
Date

KB/SDP
Bechtel Project Engineer

5/22/85
Date

4. Public Service Electric and Gas Company review:

W. S. Suckale
Chief Project Engineer

5/22/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 13 Rev. 0 Date 5/13/85
R/CR No. 13 Rev. 0 Date 5/22/85

- a) Design Specification 10855-M-68(Q) has been in the process of revision to be consistent in format to 10855-M-67(Q), Rev. 4 and the Table 2 load combinations will be consistent with the FSAR table 3.9-8.
- b) The process by which FSAR commitments are implemented in the design is described in EDP-4.22 and 4.23 for review and incorporation of FSAR sections and changes, respectively. The FSAR commitments are implemented, even if the governing design document has not yet been revised to reflect these commitments.

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OR No. 14 Rev. 0 Date 5/17/85
R/CR No. 14 Rev. 0 Date 5/21/85

1. Classification of Observation (by S&L):

- ☒ Not significant to safety
☐ Significant to safety
☐ Additional Information required

2. Reviewee proposed resolution:

See sheet 2.

3. Reviewee resolution report by:

S. Shwachena
Discipline Group Supervisor

5/24/85
Date

B. KB/ J. Paden
Bechtel Project Engineer

5/22/85
Date

4. Public Service Electric and Gas Company review:

W. C. G. L. / J. P. G.
Chief Project Engineer

5/23/85
Date

5. S&L's disposition of Resolution/Completion Report:

- ☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable, observation closed.
☐ Additional action to be taken by Reviewee (provide additional information).

6. Final classification of observation by Review Committee:

- ☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 14 Rev. 0 Date 5/17/85
R/CR No. 14 Rev. 0 Date 5/21/85

- A. Justify why the horizontal and shear rebar spacing deviates from the ACI code.

The maximum rebar spacing of the ACI 318-71 code, Sections 7.4.3 and 17.6.1, applies to normally proportioned wall and slab construction and, as such, does not apply to mass concrete construction typical of the reactor building basemat. Based on our interpretation of the Code, mass concrete construction refers to members in excess of a minimum least dimension of six feet. The least dimension of the basemat is 14 ft.

The following considerations were addressed in the basemat rebar design:

- a. The mixing, placing and curing of concrete were performed in accordance with the mass concrete recommendations of ACI 207. (It should be noted that these mixes generally eliminate the need for rebar to control cracking due to shrinkage and temperature.)
- b. The basemat is placed well below grade and subjected to very small temperature changes without exposure to corrosive materials. The design meets the crack control requirements of ACI 224.
- c. The reactor building basemat was evaluated by an extensive analysis and as such meets the special structure provisions of the Code. It should be noted that the ACI 318-71 provisions (Section 10.6) for the crack control parameter "2" were met. In addition, the basemat flexural strength was evaluated using typical cracked section assumptions, i.e. the tensile strength of concrete is assumed negligible. This provides a very large measure of conservatism in that the finite element analysis results show concrete tensile stress levels below the normal code design values for the modulus of rupture.
- d. The lack of a maximum rebar spacing requirement for mass concrete construction in ACI 349 and recent ASME Section III Division 2 is also used as guidance.

- B. Update FSAR to document this exception.

The basemat rebar spacing has been documented in FSAR Section 3.8.5.1 and figures 3.8-38 through 3.8-42. Therefore no revisions to the FSAR are required.

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- C. Provide assurances that all other rebar spacing complies with the requirements of ACI 318-71.

General Civil-Structural Design Criteria, D2.1, identifies ACI 318-71 Code as the basis for design of reinforced concrete structures where applicable. The design calculations and drawing development process is controlled by the Engineering Department Procedures (EDPs). These procedures dictate the proper origination, checking and approval of all design documents to assure that the design requirements are met. Accordingly, adequate assurances exist that the rules of ACI 318-71 regarding rebar spacing are complied with where required.

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OR No. 15 Rev. 0 Date 5/17/85
R/CR No. 15 Rev. 0 Date 5/24/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2

3. Reviewee resolution report by:

S. Shrivacharya
Discipline Group Supervisor

5/24/85
Date

JCS KB/55P
Bechtel Project Engineer

5/24/85
Date

4. Public Service Electric and Gas Company review:

W. G. Gentry
Chief Project Engineer

5/24/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

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- A. The cable tray supports are inherently stiffened in the longitudinal direction by the tray system. Accordingly, the unbraced length of the vertical members should be measured from the support point at the ceiling to the top tier tray. Therefore, the connection location between the vertical and longitudinal brace members need not be considered for calculating the unbraced length of vertical member. In calculation 677-03(Q), pages 19-26, the vertical members are braced for out-of-plane buckling by each cable tray. The calculated stresses meet the AISI design requirements.
- B. Calculation 677-334(Q) shows that the assumptions used in design of cable tray supports are conservative even if the self-weight of the supports are neglected. Computer runs of 2 and 4 tray systems were made with the weight of supports included. The forces and moments in the members and joints from the computer output were compared with those calculated using project hand calculations, which conservatively use peak accelerations in three directions and neglect the support member weights. In all cases, except for the horizontal member at the longitudinal brace, the hand calculation methods were shown to be conservative. For horizontal members, the computer runs result in slightly higher stresses. It is determined that these stresses compare reasonably with the stresses obtained from the hand calculations if the conservatism in the input load is reduced.
- C. Calculation 677-03(Q), sheets 27 to 29, evaluated the 03 support with 7'-0" maximum dimension from the top of the support to the top tray level. 7'-0" maximum dimension is also used in our reassessment calculation for 03 support.
- D. The ± 2 " horizontal and vertical cable tray location tolerance allowed in Note 3.11, E-1406-0 is judged to be insignificant as compared to the conservatism built into our evaluation. Therefore, no specific calculations were prepared. The $+1'-0$ " vertical support length tolerance permitted in Note 8.2.5 III of E-1406-0 is allowed to facilitate construction. The effect of these tolerances is being evaluated using as-built data in our reassessment program.

General Note

The Hope Creek Project has a program to evaluate the effect of the tolerances on an on-going basis as as-built data becomes available in accordance with design criteria D2.12. This effort will confirm that the FSAR commitments are met.

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 1 of 2

RESOLUTION/COMPLETION REPORT

OR No. 16 Rev. 0 Date 5/16/85
R/CR No. 16 Rev. 0 Date 5/22/85

1. Classification of Observation (by S&L):

X Not significant to safety
 Significant to safety
 Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

Robert Henderson
Discipline Group Supervisor

5/22/85
Date

KB/MDP
Bechtel Project Engineer

5/22/85
Date

4. Public Service Electric and Gas Company review:

W. Smith
Chief Project Engineer

5/22/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 16 Rev. 0 Date 5/16/85
R/CR No. 16 Rev. 0 Date 5/22/85

Although suppression pool level instruments on P&ID M-55-1 did not reference to GE elementary diagram (791E420AC), this would not cause omissions in the required design, because the development of the logic diagram is not solely based on the P&ID. With a GE system such as HPCI, the GE elementary diagram is an important document in development of the logic diagram. Therefore, the GE interface such as HPCI pump suction valve transfer would not be omitted as it is shown on HPCI logic diagram (J-55-0) and electrical schematic diagram (E-6075-0). Nevertheless, the P&ID will be revised to show the suppression pool level instrument reference to GE elementary diagram (791E420AC).

MAY 30 '85 0283364

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
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RESOLUTION/COMPLETION REPORT

OR No. 17 Rev. 0 Date 5/20/85
R/CR No. 17 Rev. 0 Date 5/30/85

1. Classification of Observation (by S&L):

☐ Not significant to safety
☐ Significant to safety
☒ Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

(Cont'd. on Sheet 2)

3. Reviewee resolution report by:

G. J. Stone / BCF
Discipline Group Supervisor

May 29, 1985
Date

Leo Krinard
Bechtel Project Engineer

5/30/85
Date

4. Public Service Electric and Gas Company review:

William G. Gentry
Chief Project Engineer

5/30/85
Date

5. S&L's disposition of Resolution/Completion Report:

☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable,
observation closed.
☐ Additional action to be taken by Reviewee (provide
additional information).

6. Final classification of observation by Review Committee:

☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

MAY 30 '85 1283364

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 3

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 17 Rev. 0 Date 5/20/85
R/CR No. 17 Rev. 0 Date 5/30/85

Items 2(a) and (b)

National Forge was selected as the supplier for Hope Creek's flued head penetrations. As delineated in General Project requirements spec (G-001), Bechtel is responsible for verifying conformance to the QA program committed by the vendor. National Forge sub-contracted the analysis work to Basic Technology Incorporated (BTI). The responsibility for conformance to National Forge's QA program by BTI lies with the vendor (National Forge). The material requisition, along with necessary Tech. Specification (P-404(Q)) and General Project Requirements (G-001 and G002) were issued to National Forge (NF) on 5/10/76. BPC Drawing P-3001-1, Rev.0, dated 5/10/76, was issued at the same time for Engineering only. The revision block of BPC Drawing P-3001-1, Rev.0, indicates "Issued for Construction"; however, control of fabrication by National Forge was exercised by placing a hold on the flued heads. Section 4.0 of the technical Spec. clearly identifies that "prior to commencing fabrication, the seller shall submit stress analysis calculations for all flued heads in accordance with NA-3350 of the Nuclear Power Plant Component Code, for approval by the buyer. The seller's stress calculations shall establish that the design of the flued head complies with all design conditions and requirements of these specifications".

This was reiterated during several meetings and correspondence with National Forge (see Sheet 7.8, Quest.#3 of BTI report Vol I of II). Also, National Forge's letter (see Attach.2), item 7 discusses the same subject.

The preliminary stress report was submitted to Bechtel for the first time on September 14, 1977. As is evident from National Forge's letter (see attach.3), the reason for stress report to be stamped "preliminary" is to distinguish it from "final" submittal of the report once the normal, upset, emergency and faulted conditions are defined. But it does not suggest that calculations are "preliminary". In addition to that, the above letter requests Bechtel's approval and official release to proceed with manufacturing of penetration. This report was reviewed by our staff for compliance with the design specifications (see Attach.4). Attachment 5 is the letter from National Forge providing resolution of Bechtel comments on 1977 submittal of the report.

From the above, it is clear that calculations did exist prior to fabrication of the penetration. Such calculations were reviewed by Bechtel for design specification compliance. The accuracy of calculations and other QA requirements pertaining to performance of calculation continues to be the responsibility of the vendor. Also, at no point was the design process compromised, as is evident from

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 3 of 3

RESOLUTION/COMPLETION REPORT
(continuation sheet)

OR No. 17 Rev. 0 Date 5/20/85
R/CR No. 17 Rev. 0 Date 5/30/85

series of meetings and correspondence documented in Sheets 7.3 through 7.20 of the BTI Report, Vol.I.

Item 2(c)

The Design of the Hope Creek flued head penetration is based on Peach Bottom. The major dimensions (overall size) of the penetrations were developed to suit Hope Creek's unique plant conditions. This drawing was issued for bid as Rev.A in 1975. Since actual piping loads under various plant conditions were not developed, pipe failure loads were generated based on draft copy of BPC's "Standard Flued Head Design Criteria, Aug.1975", in 1975.

The loads were generated by direct substitution of pipe properties in equations provided in the above document. These loads were directly put on Rev. 0 of P-3001-1 dwg., and was coordinated with appropriate groups. The loads were checked by the stress group leader as is evidenced by his signature. There was no need for a separate calculation to document these substitutions in the equation. In response to your question, we provided you with the verification calculation SC27-1, which showed that the loads provided to National Forge were correct and were indeed based on the equations given in the above document. Prior to issuance of drawings for bid, the flued head sizes were reviewed by our staff (see Attachment 1).

Item 4(a)

The process used by Bechtel in the design of mechanical penetration was explained in IDVP intercompany meetings No.2 & 3 as documented by attachment #3 to your letter LSP-20 of April 25, 1985. The attachment is included with this response. As the design process was not violated, as evidenced by the foregoing, it is also evident that the management processes necessary to control activities were also in effect.

Item 4(b)

Bechtel reviewed the calculations in accordance with the requirements of EDP 4.58 (refer to Sec.3.2) and the procurement documents. It is our position that the BTI calculations as they exist are sufficient to demonstrate the adequacy of the present design and that, once normal, upset, emergency and faulted loads calculated during As-built Reconciliation program are provided to the vendor, they will be enveloped by the present design based on pipe failure loads. This will be documented by the vendor by issuing "Final" certified stress reports on flued head penetration.

MAY 30 '85 0283364 P-47 file

ATT. 1

Bechtel Power Corporation

Interoffice Memorandum

To J. Han w/o

File No. 10855

Subject Hope Creek Job 10855
Flued Head Details

Date March 28, 1975

From F.E. Vinson

Of SFPD Stress Group

Copies to K. Dalal w/a
M. Schletz w/o
Ted Pao w/o
File SG 75-138

At Met 35 D/4 Ext 0680

The flued head sizes listed in the flued head detail drawing SK-P-200 Rev. 0 have been reviewed and found to be acceptable for the pipe failure condition. Since no pressure and temperature cyclic loading conditions are given, the fatigue evaluations for Class I flued heads are not included in this review.

The failure moments and forces for flued heads P17, P18, P19 and P20 are given in the drawing per your request.

F.E. Vinson

FEV:CYC:vgw

ATT. 2



NATIONAL FORGE COMPANY

IRVINE, WARREN COUNTY, PENNSYLVANIA 16329

May 19, 1977

See item 10
P. 2

P-404(Q) corresp.
from Natl Forge

Bechtel Power Corporation
50 Beale Street
San Francisco, California 94119

Attention: Mr. J. Han
Project Engineer
Hope Creek Generating Stations
Units 1 and 2

Subject: Bechtel Purchase Order 10855-P-404-AC
National Forge Shop Order 60-A-3047
Hope Creek Generating Stations
Units 1 and 2
Flued Head Fittings for Containment Liner

Reference: National Forge & Bechtel Meeting
Conducted May 11, 1977

Gentlemen:

Attached are National Forge's minutes of the meeting conducted in your offices on May 11, 1977 for your review and information concerning your Purchase Order 10855-P-404-AC.

Should you have any questions pertaining to these minutes, please
feel free to contact the writer.

Very truly yours,

NATIONAL FORGE COMPANY

Koss R. Porter
Product Specialist

RRP/mrs

Enclosures

[illegible]

MAY 30 '85 0283364

056683

MINUTES OF MAY 11, 1977 MEETING
HOPE CREEK GENERATING STATION
UNITS 1 AND II
BECHTEL'S PURCHASE ORDER 10855-P-404-AC
NATIONAL FORGE'S SHOP ORDER 60-A-3047

The following notes represent National Forge's understanding of the various points discussed during our May 11, 1977 meeting.

1. A purchase order change will be issued to National Forge by May 13, 1977 incorporating Bechtel Power Corporation's Drawing P-3001-1, Revision 2 and a material change to SA-182, Type 316L for all double and instrumentation flued head penetrations.
2. National Forge's Heat Treat Procedure, HT-60-A-3047-OC, for stainless steel penetrations is to be revised in accordance with a wire sent to National Forge on May 9, 1977.

This wire indicates that stainless steel forgings shall be quenched to a black condition within 3 minutes, instead of being below 800°F. in 3 minutes as presently stated.

National Forge has agreed to revise this procedure; Bechtel will modify their specification to reflect the same information as given on this telex.

3. We discussed that some of the penetrations being produced to an August 1978 delivery date would be ready for shipment to Dravo between 6 to 8 weeks prior to this August 1978 date, and requested that in this case we be allowed to ship early. Mr. Frame indicated that this would be acceptable, and requested that we point out those penetrations that may be shipped early on our weekly status report.
4. Mr. Strong indicated that the present purchase order required delivery dates will be modified to reflect a delay of approximately 3 months in the forthcoming purchase order amendment.
5. We proposed the attached schedule for submittals and approvals of the various information necessary for proper performance on this contract. This schedule was satisfactory to all present and will be reflected in our weekly status report.
6. National Forge was requested to supply rough lead times for melt, mechanical test and shipments so that Bechtel may plan accordingly.

7. We reconfirmed that National Forge, upon receipt of all information, i.e., Bechtel's Drawing P-3001-1, Revision 2, was released to proceed with engineering only.

We pointed out that the prices noted for a material change to SA-182, Type 316L material for all double and instrumentation flued heads was based on early procurement of billet material during August/September 1977.

MAY 30 '85 0283364

ATT 3



NATIONAL FORGE COMPANY

IRVINE, WARREN COUNTY, PENNSYLVANIA 16329

September 14, 1977

Bechtel Power Corporation
50 Beale Street
Post Office Box 3965
San Francisco, California 94119

*P-404(Q) corresp. from
Natl Forge*

Attention: Mr. J. Han
Project Engineer
Hope Creek Generating Stations

Subject: Bechtel Purchase Order 10855-P-404(Q)-AC
National Forge Shop Order 60-A-3047
Hope Creek Generating Stations
Units 1 and 2
Flued Head Fittings for Primary Containment Penetrations
Submission of Preliminary Stress Report

Gentlemen:

Attached please find two (2) copies of Volume I and Volume II of National Forge's Stress Report DTI-76079, dated August 1, 1977 for your review and approval.

As you will note, the coversheets are stamped "preliminary" and indicate that this stress report does not provide for the normal upset and emergency conditions, but only for the faulted conditions which have been shown on your Drawing P-6001-1.

Once we have received the remaining loadings and loading combinations, we will complete this stress report and resubmit for official approval.

We would appreciate your review of this preliminary stress report and your official release to procure and proceed with manufacture of the penetrations indicated by October 24, 1977.

Should you have any questions pertaining to this submittal, please feel free to contact us.

Very truly yours,

NATIONAL FORGE COMPANY

Ross R. Porter
Assistant Manager
Special Products

RRP/mrs

Enclosures

SEP 19 1977
ATTACHMENTS
TO DOC. #
ARE LOCATED
IN SDC

MAY 30 '85 0283364

C68877?

Bechtel Power Corporation

Interoffice Memorandum

ATT. 4

To J. Han

File No. 10855

Subject Hope Creek Job No. 10855
Flued Head Stress
Analysis

Date October 13, 1977

From L.E. Shipley

Of SFPD Plant Design

Copies to J. Frane w/o
K. Dalal w/a
T. Pao w/o
File SG 77-424

At Met 35 D/4 Ext. 0678

*P-404(Q) per letter file*Reference: IOM from F.E. Vinson to J. Han
dated September 17, 1976We have reviewed the stress analysis of flued head
fittings (Report No. BTI-76079, Volume I and II)
transmitted by National Forge Co. We have the following
comments:

OCT 17 1977

HOPE CREEK-10855	
TEST INFO	DATE
G.B. JONES	
ENGRG MGR.	
J. HAN	
D.Y. ONG	
A. LANGMO	
R.B. JONES	
B. SHICKER	
ARCH.	
CIVIL	
CON. SYS.	
ELECT.	
MACH.	
PIT. DES.	
PIPE	
COST ESTIM.	
PROC. MGR.	
PURCH. AGT.	
SIC. SUPV.	
EXPEDITING	
PHQS.	
CA	
CAS. SUPV.	
PLANNING	
CONST. COORD.	
PROJ. ADMIN.	
FIELD CM.	
READING FILE	
PIL	
FILE P-404(Q)	

- (1) This is a preliminary stress report and it includes the results of the stress calculations for faulted condition only.
- (2) The design criteria and the methods of calculations comply with the specification.
- (3) The maximum calculated stresses for faulted condition are within the code allowable and, therefore, the calculations for faulted condition are acceptable.
- (4) According to the referenced memo, Bechtel accepts the flued head designs based on these calculations. The manufacture may proceed with the fabrication of these flued heads.

L.E. Shipley
L.E. Shipley

vgw



MAY 30 '85 0283354

071825

ATT. 5

NATIONAL FORGE COMPANY

IRVINE, WARREN COUNTY, PENNSYLVANIA

NOV 21 1977

November 17, 1977

Bechtel Power Corporation
50 Beale Street
Post Office Box 3965
San Francisco, California 94119

Attention: Mr. J. Han, Project Engineer
Hope Creek Generating Stations

Subject: Bechtel's Purchase Order 10855-P-401(Q)-AC *corresp.*
National Forge's Shop Order 60-A-3047 *from NATL FORGE*
Hope Creek Generating Stations
Units 1 and 2
Flued Head Fitting for Primary Containmentment

Reference: Bechtel's Transmittal Form for Suppliers' Documents
BTF No. HC-1486, Preliminary Stress Report

Gentlemen:

In reply to Bechtel's comments on National Forge's Preliminary Stress Report No. BJ76079, National Forge's Shop Order 60-A-3047, dated August 1, 1977 the following comments are offered.

Bechtel's Comment 1: No response necessary to this comment.

Bechtel's Comment 2: Table 3.0-3 will be revised to reflect the highest values obtained from the calculations referenced in Volume II and will be resubmitted with the final stress report.

Bechtel's Comment 3: The post processing of the stress results for Penetration 5A did not have the proper coordinate transformation angle. The program has been rerun with the proper angle and results compatible with Penetration 5B were obtained. The maximum P1 plus P2 for Penetration 5A should have been recorded as 30,745 psi.

Once National Forge has received all of the loads for the normal, upset and emergency conditions, the stress report will be finalized and the above comments will be incorporated therein.

Very truly yours,

NATIONAL FORGE COMPANY

Ross R. Porter
Ross R. Porter
Assistant Manager
Special Products

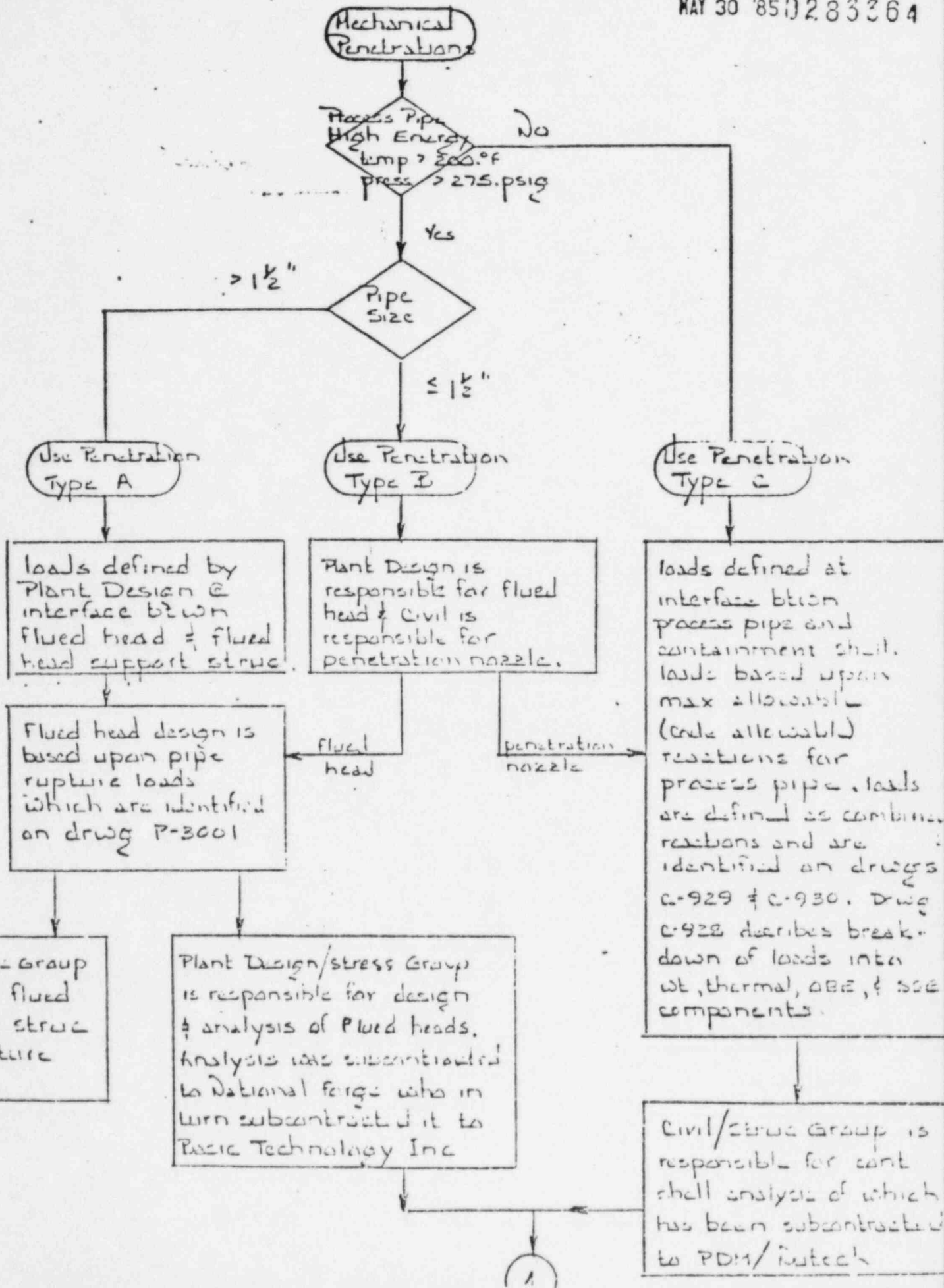
RRP/mrs

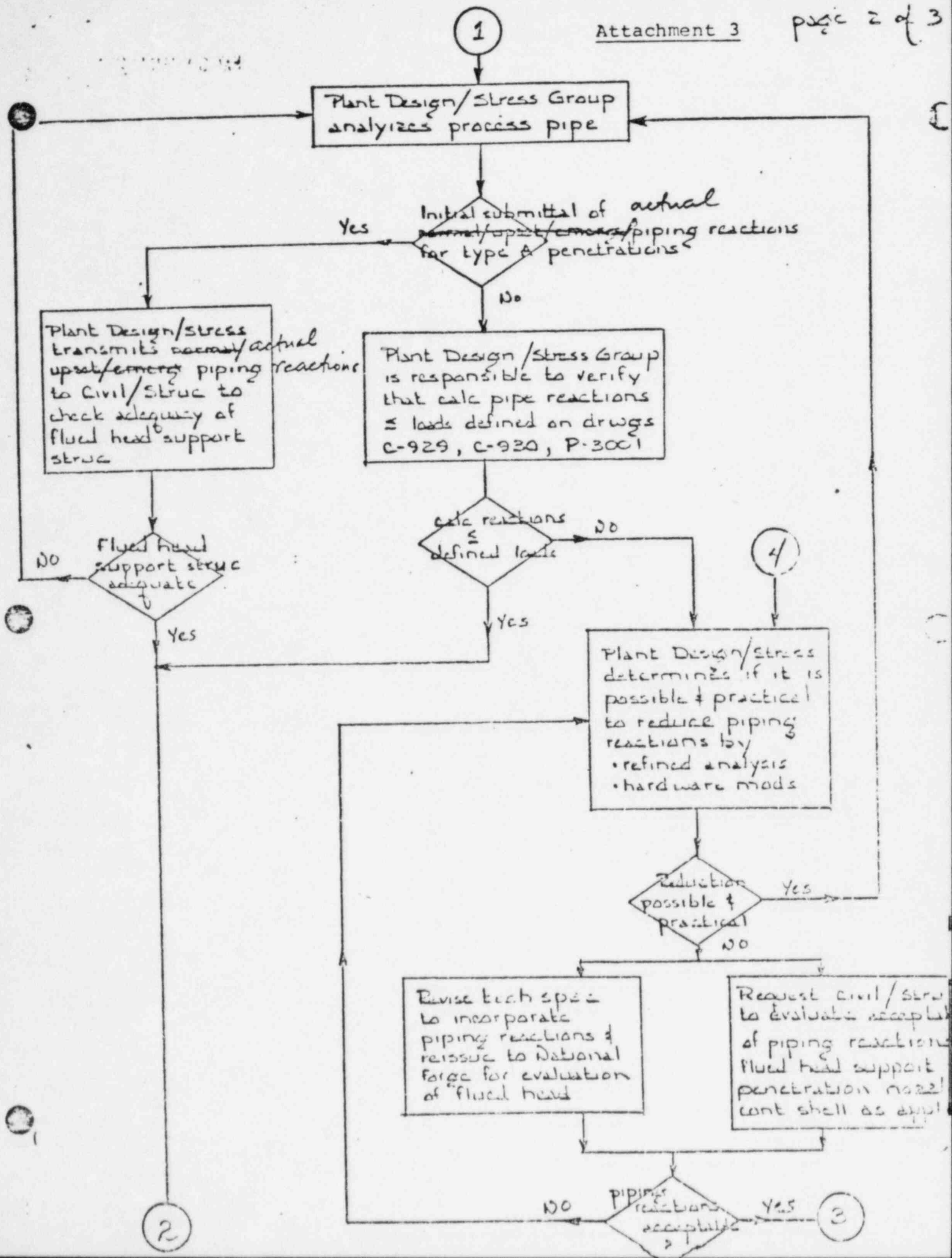
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<input type="checkbox"/>	ENGR. MGR.
<input type="checkbox"/>	J. HAN
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<input checked="" type="checkbox"/>	A. LANGMID
<input type="checkbox"/>	R. B. JONES
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<input type="checkbox"/>	CONST. COORD.
<input type="checkbox"/>	PROJ. ADMN.
<input type="checkbox"/>	FIELD CM.
READING FILE	
<input type="checkbox"/>	PL
<input type="checkbox"/>	DUE
FILE	0-401(Q)

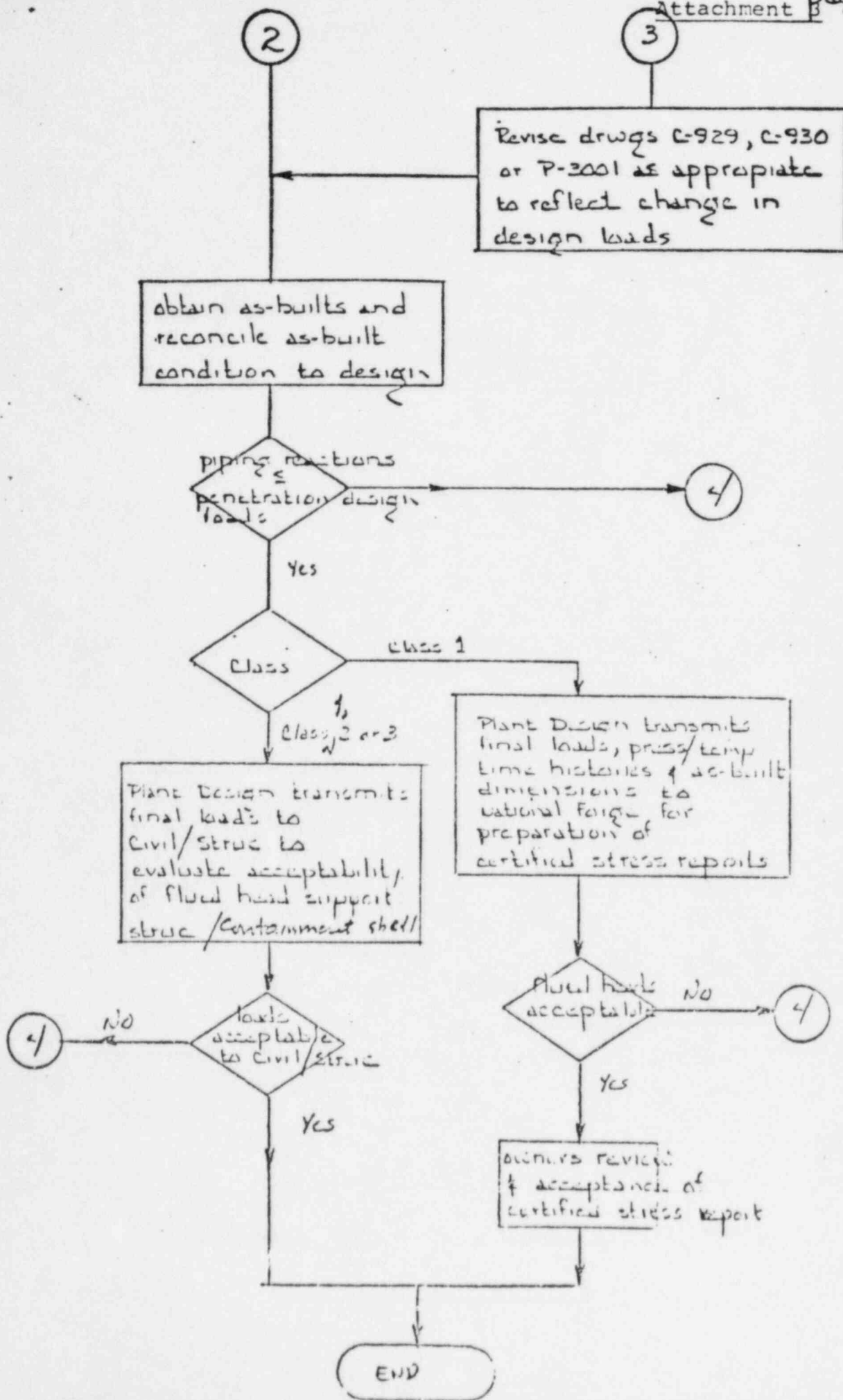
Design Process for Mechanical Penetration

Attachment 3 1 of 3

MAY 30 '85 1283364







Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 1 of 2

RESOLUTION/COMPLETION REPORT

OR No. 18 Rev. 0 Date 5/20/85
R/CR No. 18 Rev. 0 Date 5/28/85

1. Classification of Observation (by S&L):
☐ Not significant to safety
☐ Significant to safety
☒ Additional Information required

2. Reviewee proposed resolution:

The following additional information is provided:

- A. The revised Required Response Spectra (RRS) were sent to the vendor (Eaton) by Bechtel letter dated September 16, 1983 to facilitate expeditious incorporation of the design spectra in the test procedure. Patel Engineers, subcontractor to Eaton for seismic testing issued revision A of the test procedure.
 (Continued on Page 2)

3. Reviewee resolution report by:

sb Kenneth Carole
Discipline Group Supervisor

5/28/85
Date

seo James R
Bechtel Project Engineer

5/28/85
Date

4. Public Service Electric and Gas Company review:

mc2 William J. Bailey
Chief Project Engineer

5/30/85
Date

5. S&L's disposition of Resolution/Completion Report:

☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable, observation closed.
☐ Additional action to be taken by Reviewee (provide additional information).

6. Final classification of observation by Review Committee:
☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 18 Rev. 0 Date 5/20/85
R/CR No. 18 Rev. 0 Date 5/28/85

procedure No. PEI-TR-833504-1, which referred to the Bechtel Material Requisition 10855-E-118(Q), Rev. 17 and the revised RRS in Bechtel letter mentioned above (page 9 of the test procedure, attached).

- B. The seismic criteria contained in the Revision 18 of the material requisition merely compiles information provided to Eaton via Bechtel letter of September 16, 1983. Since the test procedure uses the correct spectra, it was determined that it could be used "as is".

Based on the above, we conclude that there was no breakdown in the design process for transmitting revised RRS information to the contractor, Eaton, or for reviewing subcontractor seismic reports to current requirements.

Engineering Department Procedure 4.55 describes the BPC method for control of material requisition including transmittal of revised engineering documents to the bidder/supplier. This procedure is applicable to Hope Creek project.

This observation is not significant to safety.

BEC-2/29

6.0

SEISMIC REQUIREMENTS

Floor Required Response Spectra (RRS) for both Class 1E and non-Class 1E MCC's at various plant locations and elevations are delineated in Bechtel Material Requisition No. 10855-E-118(Q), Revision 17*. Composite floor RRS curves have been generated for each orthogonal axis for both Class 1E and non-Class 1E MCC's, as documented in Patel Engineers Report PEI-TR-833502-1, and are included in Appendix I of this document.

*Note: Bechtel has provided to Eaton revised horizontal floor RRS curves for various plant locations and elevations which, to date, have not been incorporated in a formal revision to the material requisition. The revised RRS have been utilized during preparation of this test procedure. A list of RRS curve I.D. numbers is also included in Appendix I.

7.0

SEISMIC QUALIFICATION TEST PROCEDURES

7.1

General

This qualification procedure employs type testing as a method of demonstrating operability of the subject equipment before, during, and after postulated seismic environments.

Prior to performance of seismic qualification testing, Class 1E equipment shall have been subjected to age conditioning to place the equipment in its end-of-life condition.

7.2

Test Sequence

Seismic qualification testing shall be performed in the following sequence:

- o Age Conditioning of Class 1E Equipment
(Performed Previously)
- o Functional Tests
- o Resonance Search Test
- o Seismic Simulation
- o Functional Tests

Seismic qualification testing is tentatively scheduled to be performed at Farwell & Hendricks, Inc., Milford, Ohio.

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 1 of 2

RESOLUTION/COMPLETION REPORT

OR No. 19 Rev. 0 Date 5/21/85
R/CR No. 19 Rev. 0 Date 5/30/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

per Kenneth Coole
Discipline Group Supervisor

5/22/85
Date

[Signature]
Bechtel Project Engineer

5/30/85
Date

4. Public Service Electric and Gas Company review:

[Signature]
Chief Project Engineer

5/30/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 19 Rev. 0 Date 5/21/85
R/CR No. 19 Rev. 0 Date 5/30/85

2. The P.U. voltage derived for 13.8 kV (1.106 P.U.) and for 7.2 kV and 4.16 kV (1.056 P.U.) is an ideal case when only station service transformers are energized with no large motors running. In this case, there will not be any short circuit contribution from motors. A short circuit study has been done without large motor contribution and with the 4.16 kV bus voltage of 1.056 P.U. The resultant momentary short circuit current is found to be 58346 Amps, which leaves a margin of approximately 27%.

In the load flow study Calc. No.15(Q), Sh.150, case No.X, all items shown under 2a, b and c of "OR 19" have been considered and the P.U. voltage was found to be 1.003 P.U., which increases the momentary short circuit current by 235 amps., leaving the margin of 1.6% instead of 1.9%.

4. The momentary short circuit current calculated is very conservative for the following reasons:
- A. Cable impedance and non-seg bus impedance are not considered for short circuit calculations.
 - B. The actual P.U. voltage at 4.16 kV bus will be less than 1.003 P.U. if voltage drops in non-seg bus and cables are considered. This will result in lower short circuit current.
 - C. In short circuit calculation, actual transformer impedance is not considered, instead 92.5% of the nominal impedance is considered for conservatism.

In view of the above, the 4.16 kV breaker's momentary rating is not exceeded when utilizing a higher prefault voltage of 1.056 P.U.

We have reviewed other short circuit calculations (Calc. number 1.3Q) and determined that higher prefault voltage levels than nominal bus voltage of 480 V will not cause equipment ratings to be exceeded because of existing design margins.

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 1 of 2

RESOLUTION/COMPLETION REPORT

OR No. 20
R/CR No. 20

Rev. 0
Rev. 0

Date 5/21/95
Date 5/30/85

1. Classification of Observation (by S&L):

- ☒ Not significant to safety
☐ Significant to safety
☐ Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

Kenneth A. Cooke
Discipline Group Supervisor

5/30/85
Date

TKB [Signature]
Bechtel Project Engineer

5/30/85
Date

4. Public Service Electric and Gas Company review:

TKB [Signature]
Chief Project Engineer

5/30/85
Date

5. S&L's disposition of Resolution/Completion Report:

- ☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable, observation closed.
☐ Additional action to be taken by Reviewee (provide additional information).

6. Final classification of observation by Review Committee:

- ☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 20 Rev. 0 Date 5/21/85
R/CR No. 20 Rev. 0 Date 5/30/85

2. The resistor was originally sized to be inserted in the open delta secondary of the wye-delta grounding transformers to limit the 13.2 kV phase to ground fault current. In the procurement of the grounding transformers, it was found that open delta secondary was not available and the resistor was changed to the neutral of the 13.8 kV wye winding. An 0.5 ohm resistor in the 208 Volt secondary is equivalent to $(13,800)^2 \times .5 = 734$ ohms
 $\sqrt{3} \quad 208$
in the 13.8 kV neutral. Subsequent refinement of the ground fault calculation determined the resistor values as installed. PSE&G drawing 249000A1018-5, Rev.5, indicates the correct resistor sizes.
- 4a. An appropriate revision will be made to FSAR Section 8.2.1.4.
- 4b. Since high neutral resistance in 13.8 kV neutral has the same current limiting effect as a low resistance in the open delta secondary, the basic performance of the neutral grounding system is not changed. The FSAR was not updated at the time when the grounding system was modified.
- 4c. The normal procedure is to review and update FSAR when a change in design occurs. A closer coordination and interface between various concerned disciplines are being implemented.

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Hope Creek Generating Station - Unit 1

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RESOLUTION/COMPLETION REPORT

OR No. 21 Rev. 0 Date 5/21/85
R/CR No. 21 Rev. 0 Date 5/30/85

1. Classification of Observation (by S&L):

- ☒ Not significant to safety
☐ Significant to safety
☐ Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

Handwritten: H
Kenneth Coole
Discipline Group Supervisor

5/29/85
Date

Handwritten: JCO
Simon
Bechtel Project Engineer

5/30/85
Date

4. Public Service Electric and Gas Company review:

William G. Galy
Chief Project Engineer

5/30/85
Date

5. S&L's disposition of Resolution/Completion Report:

- ☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable, observation closed.
☐ Additional action to be taken by Reviewee (provide additional information).

6. Final classification of observation by Review Committee:

- ☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit-1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 21 Rev. 0 Date 5/21/85
R/CR No. 21 Rev. 0 Date 5/30/85

- 4 A. FSAR Section 8.3.1.1.2.6.b.1 will be revised to correct the impedance value of 6.75% to 9.0%, which is the nominal value. No change to FSAR Figure 8.3-12 is needed because the base drawing, E-0018-1 for this figure correctly shows the 9% value. The base drawing is listed in Table 1.7-1 of the FSAR and revisions to drawings on this table are current as of the last amendment.
- 4 B. The impedance value of 9.0% was changed by the manufacturer after the initial submittal of the FSAR, i.e. 6.75% was the correct value then. Even though the impedance value was subsequently changed on drawing E-0018-1 (FSAR Figure 8.3-12), the FSAR text value on Section 8.3.1.1.2.6.b.1 was inadvertently not updated at the same time.
- 4 C. Engineering Department Procedure (EDP)-4.22 and its corresponding instructions EDPI-4.22.1 generally describe the control of and revision to the FSAR.

MAY 30 '85 1283364

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RESOLUTION/COMPLETION REPORT

OR No. 22 Rev. 0 Date 5/21/85
R/CR No. 22 Rev. 0 Date 5/30/85

1. Classification of Observation (by S&L):

X Not significant to safety
 Significant to safety
 Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

Kenneth Coole
Discipline Group Supervisor

5/21/85
Date

James B
Bechtel Project Engineer

5/30/85
Date

4. Public/Service Electric and Gas Company review:

William Bailey
Chief Project Engineer

5/30/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 22 Rev. 0 Date 5/21/85
R/CR No. 22 Rev. 0 Date 5/30/85

- 4 A. FSAR Section 8.3.1.1.2.6.c.3 will be revised to correct the interrupting rating of 22,000 A to 25,000 A.
- 4 B. The incorrect value of 22,000 A in the FSAR, as noted by S&L, was not used in design documents. It appears that the incorrect value is isolated to this FSAR section because on FSAR Section 8.3.1.1.1.d.3 the correct value of 25,000 A is shown for non-Class 1E 480-V MCCs. The molded case circuit breakers furnished on non-Class 1E and Class 1E MCCs are of identical types and ratings.
- 4 C. Engineering Department Procedure (EDP) 4.22 and its corresponding instruction EDPI 4.22.1 generally describe the controls for updating the FSAR.

MAY 31 '85 0283372

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RESOLUTION/COMPLETION REPORT

OR No. 23 Rev. 0 Date 5/22/85
R/CR No. 23 Rev. 0 Date 5/31/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewed resolution report by:

8/12 S. Brauachay
Discipline Group Supervisor

5/30/85
Date

[Signature]
Bechtel Project Engineer

5/31/85
Date

4. Public Service Electric and Gas Company review:

MR
EL [Signature]
Chief Project Engineer

5/31/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

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RESOLUTION/COMPLETION REPORT
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OR No. 23 Rev. 0 Date 5/22/85
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The point-by-point response to the observation is provided as follows:

- a,b) Patel Engineers performed analysis of a 5 bay and a 26 bay MCC and concluded that the 5 bay configuration was critical. This analysis was performed to minimize the number of prototype testing. The analysis was not considered adequate by Bechtel Power Corporation (BPC) because of the following:

The Patel Engineers' analysis, Rev.A, dated 11/23/83 [PEI-TR-833502-1] showed F/B frequency of 35.9 Hz for 5 bay MCC. This frequency was judged to be excessive when compared with the frequencies of similar panels supplied by other vendors.

- c,d) In order to evaluate the significance of Bechtel comments and to expedite schedule, 5 bay MCC was released for testing. The test results indicated that the Patel Engineers' analysis was not adequate.

- e) BPC performed independent analyses to expedite the resolution of the above issue. BPC performed analysis of 5 bay and 6 bay MCC. The results of our analysis are given below: (Reference Calc. Nos. 678-6(Q) and 678-9(Q))

DESCRIPTION	FREQUENCY (HZ)	
	F/B	S/S
i) 5 bay MCC (Test)	10.6, 13.0	10.3, 14.0
ii) 5 bay MCC (BSAP Analysis)	12.9	11.9
iii) 6 bay MCC (BSAP Analysis)	13.0	13.8

The results of BPC analysis further show:

- o Bechtel's analytical model of 5 bay MCC closely represents the dynamic behaviour of the tested panel.
- o F/B frequencies of a 5 bay and a 6 bay MCC did not change.
- o S/S frequency of 6 bay MCC is 13.8 Hz as compared to 11.9 Hz of 5 bay MCC. This increased S/S frequency of 13.8 Hz is close to the ZPA range of floor RRS for MCCs. As number of bay increase further in MCCs the side-to-side frequency would increase further and the response would remain unchanged in the ZPA range.

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RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 23 Rev. 0 Date 5/22/85
R/CR No. 23 Rev. 0 Date 5/31/85

- o Comparison (Test No. 5, SSE) of Test Response Spectra (TRS) with the RRS indicates that there is a margin of more than 50% at the expected S/S frequencies for MCCs with more than 5 bays.
- f) Based on the above, it is concluded that MCCs having 6 to 26 bays are considered seismically qualified.

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RESOLUTION/COMPLETION REPORT

OR No. 24 Rev. 1 Date 5/23/85
R/CR No. 24 Rev. 0 Date 5/30/85

1. Classification of Observation (by S&L):

☐ Not significant to safety
☐ Significant to safety
☒ Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

B. S. Guack
Discipline Group Supervisor

5/30/85
Date

J. C. Smith
Bechtel Project Engineer

5/30/85
Date

4. Public Service Electric and Gas Company review:

William J. Gilly
Chief Project Engineer

5/31/85
Date

5. S&L's disposition of Resolution/Completion Report:

☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable, observation closed.
☐ Additional action to be taken by Reviewee (provide additional information).

6. Final classification of observation by Review Committee:

☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

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RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 24 Rev. 1 Date 5/23/85
R/CR No. 24 Rev. 0 Date 5/30/85

Response to Description of Observation:

As stated in FSAR paragraphs 1.8.1.61, 3.7.1.3.1, 3.7.1.3.2 and 3.10.2.3.1, the damping values used for Seismic Category 1 components comply with Regulatory Guide 1.61. This includes the restriction to 2% damping for active equipment under SSE conditions.

For the SACS pumps and motors, purchased under Specifications M-070(Q) and E-112A(Q), respectively, the Bechtel-prepared SQRT forms inadvertently indicated 3% damping as the damping value used for SSE conditions. The SQRT forms are non-mandatory summaries assembled for convenience in preparation for the recent NRC audit. Contrary to the described observation, the subject equipment qualification reports, prepared by the vendors, did not indicate that 3% damping was used for SSE conditions. The reports actually indicate that the pumps and motors are rigid, rendering the damping values meaningless.

Response to Recommendation for Resolution

- a. As stated above, a review of the vendor prepared qualification reports indicates that the subject equipment is rigid and, therefore, damping values are not a factor. Accordingly, there is no deviation from Regulatory Guide 1.61. To confirm that the correct damping values were used for other active equipment, the qualification reports were reviewed for non-NSSS items, along with a sampling of GE-prepared NSSS SQRT forms. This review indicated that either 2% damping was used or the equipment is rigid.
- b. 3% damping was not used for qualifying active equipment under SSE conditions. FSAR Tables 3.7-1 and 3.7-2 provide damping values for equipment in general and are not specific in regard to active equipment.
- c. To prevent future misunderstandings, FSAR Tables 3.7-1 and 3.7-2 will be revised to clarify the SSE damping values actually used for active equipment. A change notice will be issued by June 14, 1985.
- d. There was no failure in the design process. The non-design basis SQRT forms were in error and not the qualification report prepared by the vendor.
- e. Engineering Department Procedure (EDP) 4.22 and its corresponding instruction EDPI 4.22.1 generally describe the controls for updating the FSAR.

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RESOLUTION/COMPLETION REPORT

OR No. 25 Rev. 0 Date 5/21/85
R/CR No. 25 Rev. 0 Date 5/30/85

1. Classification of Observation (by S&L):
☐ Not significant to safety
☐ Significant to safety
☒ Additional Information required
2. Reviewee proposed resolution:
See Sheet 2.
3. Reviewee resolution report by:

HB [Signature]
Discipline Group Supervisor

See [Signature]
Bechtel Project Engineer

May 30, 1985
Date

5/30/85
Date
4. Public Service Electric and Gas Company review:

[Signature]
Chief Project Engineer

5/30/85
Date
5. S&L's disposition of Resolution/Completion Report:
☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable, observation closed.
☐ Additional action to be taken by Reviewee (provide additional information).
6. Final classification of observation by Review Committee:
☐ Not significant to safety
☐ Significant to safety
7. Review Committee signatures:

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Hope Creek Generating Station - Unit 1

Project No. 10855-013
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RESOLUTION/COMPLETION REPORT
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Section 2

In case of HPCI pump, GE had provided the pump allowables to Bechtel in letter GB-75-78 dated May 27, 1975. These allowables were used to qualify the equipment nozzle loads. During the new loads program, GE identified revised allowable nozzle loads. These loads were reviewed by Bechtel and found not acceptable based on present piping and support configuration. Following standard project procedures, GE was contacted for resolution of this problem. Based on GE's recommendation, Bechtel provided actual piping loads on HPCI pumps. GE included these loads during the SQRT program and have come up with new sets of allowable loads. GE recently advised Bechtel to refer to the SQRT report for the HPCI pump allowables.

Bechtel is in the process of verifying acceptability of the new allowable loads as they appear in the SQRT report. If found unacceptable, additional analyses will be performed to meet the nozzle loads provided in the SQRT report. The new allowable loads will be reflected in the FSAR. The correspondence involved in the above dialogue with GE was sent to S&L per S&L's earlier request.

The omission of definition of F_0 & M_0 in Table 3.9-5V was an oversight. FSAR Change Notice will be written to include definition of F_0 & M_0 .

Section 4

4.a As discussed in Section 2.0, FSAR section 3.9 will be revised through FSAR change notice process to reflect the new allowables. The discussion on nozzle loads in Design Specification M-068 has been deleted from the current revision in progress.

4.b(1) There was no failure in the design process because the procedure and outlined below was followed in the case of HPCI pump allowable
4.b(2) loads.

In the stress analysis of the piping system, the allowable loads on the equipment are obtained by the analyst from one of the following sources:

- a) letter from vendor;
- b) allowables given directly on the equipment drawing;
- c) allowables provided in Bechtel Design/Tech.Specs.

The exact source of allowable nozzle loads is identified by the stress analyst in his calculation package. If the allowable load, as given, cannot be met, the cognizant engineer in the Mechanical/Nuclear discipline is contacted. The appropriate vendor is contacted and the overload condition is resolved either through additional re-analysis on the part of the vendor or additional

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Hope Creek Generating Station - Unit 1

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RESOLUTION/COMPLETION REPORT
(Continuation Sheet)

OR No. 25 Rev. 0 Date 5/21/85
R/CR No. 25 Rev. 0 Date 5/30/85

supports on the piping system. This resolution is documented through letters and telecons or modification of vendor drawing. The procedure for resolving overloaded nozzle condition is discussed in Stress Group Procedures for Piping Stress Analysis (See Sec. 8.3). In case of NSSS piping and equipment, the project has a GE coordinator. One of his job responsibilities is to provide liaison between GE and Bechtel in the area of information exchange.

Any change in the equipment allowable nozzle loads is coordinated with the plant design group by the cognizant Mechanical/Nuclear Engineer. This information is disseminated to the stress analyst involved in the analysis of that particular system. The approved revised allowable nozzle loads are taken into account during the revision of an existing calculation.

- 4.c The design information, specifically the pump nozzle loads in Sec. 3.9, were provided by GE based on the current information at the time of FSAR submittal. GE has recently informed Bechtel of some changes in these values based on their SORT review. Once Bechtel's review of these new allowables is completed, the new values will be referenced in Sec. 3.9.

It should be noted that Bechtel has committed to the NRC in response to FSAR Question 210.2 to provide actual nozzle loads in applicable table 3.9-5, where such information is currently marked "later". These values will have taken into account as-built reconciliation of the piping system. This information is currently forecasted to be completed by June, 1985.

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Hope Creek Generating Station - Unit 1

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RESOLUTION/COMPLETION REPORT

OR No. 27 Rev. 0 Date 5/21/85
R/CR No. 27 Rev. 0 Date 5/31/85

1. Classification of Observation (by S&L):

- X Not significant to safety
 Significant to safety
 Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

ib LCOesterick for Pratt
Discipline Group Supervisor

5-30-85

Date

[Signature]
Bechtel Project Engineer

5/31/85

Date

4. Public Service Electric and Gas Company review:

SPS W. Gault
Chief Project Engineer

5-31-85

Date

5. S&L's disposition of Resolution/Completion Report:

- Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

- Not significant to safety
 Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

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RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 27 Rev. 0 Date 5/21/85
R/CR No. 27 Rev. 0 Date 5/31/85

Following is our response to the recommendation for resolution:

- 4.a Design Specification M-068, Rev.2, will be revised to reflect the commitments shown in the FSAR. It should be noted that FSAR Sections 5.2.4 and 3.9.6 are the applicable sections for Class 1 piping design. For Class 2 and 3 piping design, FSAR Section 6.6 is applicable. This section requires that pre-service inspection be performed in accordance with the 1977 Code with Addenda through Summer 1978, and in-service inspection to the Code edition and Addenda in effect 12 months prior to receipt of the operating license.
- 4.b The pre-service inspections being performed on site are in accordance with the current FSAR commitment, as evidenced in Startup Instruction No.A-28, dated January 11, 1985 and the HCGS PSI examination plan dated February, 1984. A copy of these documents will be transmitted separately to S&L by June 7, 1985.
- 4.c Design Specification M-068, Rev. 2, reflects the pre-service inspection requirements, which were in effect at the time of issuance (January 31, 1979). Design Specification M-068 has been in the process of revision to incorporate current FSAR commitments which are being met on the Hope Creek Project. As described in 4.a and b above, the delayed revision of M-068 has not resulted in licensing, design or construction deficiencies.
- 4.d In general, design specifications are prepared as a basis for the initial design and are revised periodically to reflect changes in the design requirements as the design process continues. While certain inconsistencies between the specification and the actual design may exist from one revision to the next, the actual design will reflect the current requirements which are implemented as a result of FSAR commitments, field changes, etc. Prior to completing the final design, any differences between the design specification and the actual asbuilt design will be reconciled.

Engineering Department Procedures (EDP) 4.22 and 4.23 and the corresponding Instructions, EDPI 4.22.1 and 4.23.1, generally describe the controls for updating the FSAR.

STARTUP INSTRUCTION A-28
PSI EXAMINATION AND TESTS

INDEX

ONLY APPLICABLE PORTIONS
INCLUDED FOR RESOLUTION
OF OR #27

- 1.0 PURPOSE
- 2.0 SCOPE
- 3.0 GENERAL
 - 3.1 NUCLEAR CLASS PIPING
 - 3.2 SOUTHWEST RESEARCH INSTITUTE NDE AREAS
 - 3.3 SAFETY RELATED AND NUCLEAR CLASS PUMPS
 - 3.4 SAFETY RELATED AND NUCLEAR CLASS VALVES AND VALVE TEST CATAGORIES
 - 3.5 HYDROSTATIC TEST AND LEAK EXAMINATION BOUNDARIES FOR SAFETY RELATED AND NUCLEAR CLASS 1, 2, AND 3 SYSTEMS
 - 3.6 SAFETY RELATED AND NUCLEAR CLASS 1, 2, AND 3 HANGERS
 - 3.7 SAFETY RELATED AND NUCLEAR CLASS 1, 2, AND 3 HANGERS (SNUBBERS)

ATTACHMENTS

- .1 LIST OF SYSTEMS WITH SAFETY RELATED NUCLEAR CLASS PIPING
- .2 LIST OF SYSTEMS INCLUDED IN SWRI NDE PROJECT PLAN
- .3 LIST OF SAFETY RELATED AND NUCLEAR CLASS 1, 2, AND 3 PUMPS
- .4 LIST OF SAFETY RELATED AND NUCLEAR CLASS 1, 2, AND 3 VALVES AND VALVE TEST CATAGORIES
- .5 LIST OF HYDRO TEST AND LEAK EXAMINATION SYSTEMS
- .6 LIST OF SAFETY RELATED AND NUCLEAR CLASS 1, 2, AND 3 HANGERS (SUPPORTS)
- .7 LIST OF SAFETY RELATED AND NUCLEAR CLASS 1, 2, AND 3 HANGERS (SNUBBERS)

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REV. NO. 1
REV. DATE: 01/11/85
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STARTUP INSTRUCTION NO. A-28
PSI EXAMINATIONS AND TESTS

I. PURPOSE

The purpose of this instruction is to identify all systems and components that require PSI Base Line Examination and Test Documentation as required by Section XI, ASME Code, 1977 Edition, Summer 78 Addenda.

II. SCOPE

The scope of this instruction is limited to those systems and components to be examined and tested in accordance with Section XI and NRC guidance letters.

III. GENERAL

3.1 Nuclear Class Piping

- 3.1.1 There are many plant systems that have all or portions of the system designated as safety related and nuclear class 1, 2, and 3. Attachment A-28.1 is a list of the systems, P&ID Nos., system ID, nuclear classes within the system, and a brief note defining the extent of the system that is safety related and nuclear class.

3.2 Southwest Research Institute (SWRI) NDE areas

- 3.2.1 Attachment A-28.2 provides a list of systems included in the SWRI PSI Project Plan. The list includes P&ID Nos., Fabrication Isometric Nos., System Isometric Nos., and nuclear class of piping to be examined.
- 3.2.2 The specific pipe and component welds to be examined and items exempted from examination will be included in the SWRI PSI project plan. The project plan will not be included in this instruction due to bulk. A copy of the PSI project plan is available in the PSI Coordinator's office.

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3.3 Safety Related and Nuclear Class 1, 2, and 3 Pumps and valves and valve test categories.

3.3.1 See Attachment A-28.4 Letter from L. Lake, ISI Program.

3.4 PSI Hydro Test and Leak Examination Boundaries

3.4.1 Attachment A-28.5 lists safety related and nuclear class piping that requires hydrostatic test and pressure boundary structural leak examination documented.

3.5 Safety Related and Nuclear Class 1, 2, and 3 Hangers (Supports)

3.5.1 Attachment A-28.6 is a list of hangers, type of hanger, pipe size, and system isometric.

3.6 Safety Related and Nuclear Class 1, 2, and 3 Hangers (Snubbers)

3.6.1 Attachment A-28.7 is a list of snubbers, general location and elevation, mfg. type and size, class, serial no. (later), pipe size, system isometric no., site coordinates, and operational radiation zone.

Approved for issuance:


Startup Manager

GD:sd

SI NO. A-28
REV. NO. 1
REV. DATE: 01/11/85
PAGE 3 of 3

EXAMINATION PLAN FOR THE PRESERVICE EXAMINATION
OF SELECTED COMPONENTS AND PIPING OF
THE HOPE CREEK GENERATING STATION, UNIT 1

ONLY APPLICABLE
PORTIONS INCLUDED FOR
RESOLUTION OF OR #27

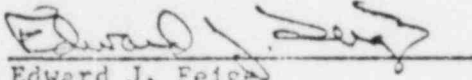
VOLUME I
EXAMINATION PLAN
SWRI Project 17-3690

Prepared for

Public Service Electric and Gas Company
80 Park Plaza
Newark, New Jersey 07101

February 1984

Prepared by


Edward J. Feige
Project Engineer
Inspection Engineering
Section

Approved by

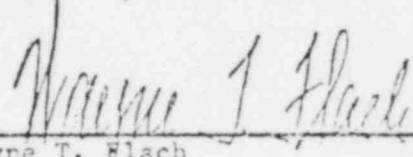

Wayne T. Flach
Director
Department of Engineering Services
Quality Assurance Systems and
Engineering Division

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- A. Class 1 Isometric Drawings
- B. Class 2 Isometric Drawings
- C. Listing of Class 1 and Class 2 Drawings
Used to Develop the PSI Plan
- D. Bechtel Plant Locator Diagrams
- E. Nondestructive Testing Procedures

VOLUME III - APPENDICES (CONT'D)

- F. Ultrasonic Calibration Block Drawings
- G. Weld Surface Finish Recommendations
- H. Examination Support Requirements
- I. Hydrostatic and Leak Test Requirements
- J. Component and Line Examination Requirements
- K. Hanger Examination Table (Tables to be provided by PSE&G)

LIST OF ABBREVIATIONS

A	-	Anchor
ASME	-	American Society of Mechanical Engineers
BC	-	Branch Connection
CCS	-	Containment Spray System
CRT	-	Cathode-Ray Tube
DAC	-	Distance Amplitude Correction
ECCS	-	Emergency Core Cooling System
G	-	Guide
H	-	Hydraulic Suppressor
HPCI	-	High Pressure Coolant Injection System
HXXX	-	Hanger Number Identification
ISI	-	Inservice Examination
LGS	-	Lugs
Lo	-	Zero Reference Location
Mech UT	-	Mechanized Ultrasonic Examination
MT	-	Magnetic Particle Examination
NDE	-	Nondestructive Examination
NQAP	-	Nuclear Quality Assurance Procedure
NQAPM	-	Nuclear Quality Assurance Program Manual
PSE&G	-	Public Service Electric and Gas Company
PSI	-	Preservice Examination
PT	-	Liquid Penetrant Examination
QA	-	Quality Assurance
R	-	Rigid Support
RCIC	-	Reactor Core Isolation Cooling System
RHR	-	Residual Heat Removal System
RPV	-	Reactor Pressure Vessel
RT	-	Radiographic Examination
RVED	-	Reactor Vessel Examination Device
S	-	Sway Suppressor
Scan Plan	-	Mechanized Examination Plan
SwRI	-	Southwest Research Institute
U	-	Under Support
UT	-	Manual Ultrasonic Examination
V	-	Variable Spring
VT	-	Visual Examination
X	-	Snubber

LIST OF SYSTEM DESIGNATORS

AB - Main Steam
AE - Feedwater
AP - Condensate Transfer and Storage
BB - Nuclear Boiler and Recirculation
BC - Residual Heat Removal
BD - Reactor Core Isolation Cooling
BE - Reactor Core Spray
BG - Reactor Water Cleanup
BJ - High Pressure Coolant Injection
FC - Reactor Core Isolation Cooling System (RCIC) Turbine Steam
FD - High Pressure Coolant Injection System (HPCI) Turbine Steam

I. INTRODUCTION

This document is a plan for the performance of the preservice examination (PSI) of Class 1 and Class 2 piping and components of Public Service Electric and Gas Company's (PSE&G) Hope Creek Generating Station, Unit 1. In addition to the piping and components it also includes:

- (1) Weld Surface Finish Recommendations (Appendix G)
- (2) Examination Support Requirements (Appendix H)
- (3) Hydrostatic and Leak Test Requirements (Appendix I)
- (4) Hanger Support Examination Requirements (Appendix K, to be provided by PSE&G)

The PSI plan has been prepared in accordance with the following:

- (1) ASME Boiler and Pressure Vessel Code 1977 Edition of Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components" with Addenda through Summer of 1978 and as modified by 10CFR50.55a (b)(2).
- (2) ASME Boiler and Pressure Vessel Code 1977 Edition of Section V, "Nondestructive Examination" with Addenda through Summer 1978.
- (3) Southwest Research Institute (SWRI) Plan, 82-PEG-HCP-1-1-1, Project 17-3690, "Project Plan for the Preservice Examination of Hope Creek Generating Station, Unit 1," to include SWRI Revision 1, dated January 1984.
- (4) SWRI Nuclear Quality Assurance Program Manual, Revision 2, with all applicable changes.
- (5) Regulatory Guides, as applicable.

The components and systems included in this Examination Plan are as follows:

A. Class 1 Systems, Components, and Supports

Reactor Pressure Vessel (RPV) and Closure Head
Reactor Recirculation Pumps
Main Steam Isolation Valves
Reactor Recirculation Maintenance Isolation Valves
Main Steam System Piping
Feedwater System Piping
Reactor Recirculation System Piping
Residual Heat Removal System (RHR) Piping
Core Spray System Piping
Reactor Water Cleanup System Piping
Reactor Core Isolation Cooling System (RCIC) Turbine Steam Piping
High Pressure Coolant Injection System (HPCI) Turbine Steam Piping

B. Class 2 Systems, Components, and Supports

Residual Heat Removal Heat Exchangers (Primary Side)
Main Steam System Piping
Feedwater System Piping
Condensate Transfer and Storage Piping System
RHR Piping
Reactor Core Isolation Cooling Pump
Reactor Core Spray Piping System
High Pressure Coolant Injection Piping System
RCIC System - Turbine Steam
Core Spray Pumps
Residual Heat Removal Pumps
Booster Pump (HPCI)
HPCI Pump
HPCI System - Turbine Steam
RCIC Jockey Pump
Standby Liquid Control Pump
Standby Liquid Control Tank
Nitrogen Accumulator
RCIC Pump
RCIC Turbine
RCIC Lube Oil Cooler
RCIC Gland Seal Condenser
Valves

This plan was prepared based upon drawings and documents provided by Bechtel San Francisco (Bechtel). Appendix C provides a listing of each line and associated drawings referenced in the development of the plan.

II. PRESERVICE EXAMINATION PLAN

A. Introduction to the Tables

The accompanying tables present the details of the Examination Plan for the Class 1 and Class 2 components and piping. Also included with the plan, as requested by PSE&G, is a listing of all Class 1, Class 2, and Class 3 piping component hydrostatic and leak test requirements (Appendix I).

The tables are separated into sections according to major systems or components and further subdivided to list the actual component, area or weld to be examined. A discussion of the format and content of these tables follows and is presented in the order of the column headings appearing on each page of the tables.

1. ASME Section XI Item Number and Category

ASME Section XI Item Numbers and Categories were assigned for each component and are listed in the first and second columns, respectively. The items and categories are in accordance with Section XI, 1977 Edition with Addenda through the Summer 1978 (77/S78), except for piping in the Residual Heat Removal System (RHR) and Emergency Core Cooling System (ECCS). The extent of examination for RHR and ECCS piping welds is in accordance with Table IWC-2520 Category C-F of the 1974 Edition of Section XI with Addenda through Summer 1975 (74/S75); however, the item numbers and corresponding method of examination are as listed in the 77/S78 Section XI.

2. Weld Number and/or Examination Area Identification

Each component or system in this column is identified either by listing the name of the component or by a uniquely coded character as discussed in Section B.

3. "Method Column"

The nondestructive examination (NDE) method is listed in this column. The various methods used are:

- (a) VT-1, VT-2 (Performed during either the System Pressure or Functional Test), VT-3, and VT-4 (Visual)
- (b) VT-2/LT (Visual during Leak Test)
- (c) VT-2/HT (Visual during Hydrostatic Test)
- (d) PT (Liquid Penetrant)
- (e) MT (Magnetic Particle)
- (f) UT (Ultrasonic) Specific angles to be applied are identified as applicable. Where the angle is yet to be determined, the UT notation is followed by XX.
- (g) RT (Radiography)
- (h) ET (Eddy Current)

4. Procedure

The nondestructive testing procedure to be used for the examination is listed in the procedure column. The procedures referenced are found in Appendix E.

5. Summary Sheet Number

This number provides a unique, sequential six-digit reference for each table entry. It will also later provide a reference to a summary sheet which can precede the data package for each examination area. The first digit of the summary sheet number is representative of the system/component code class.

6. Results

The results columns, "Norec", "Insig", "Geom", and "Other" will be used for reporting purposes. An "X" will be placed in the appropriate column to identify inspection results as "no recordable", "insignificant", "geometric", or "other".

7. "Remarks" Column

The remarks column is used to provide additional information pertinent to the examinations. Typical information includes the following:

- (a) A basic calibration block for each component scheduled for an ultrasonic examination (Appendix F). This is to facilitate the users of this plan in selecting the correct calibration block for use during ultrasonic examination. In certain cases, the blocks listed have not yet been designed but have been assigned a preliminary block number. Information required for the calibration block design was not available at the time of issue of this plan.
- (b) Special examination requirements unique to a given component or system.
- (c) Other information necessary to explain unique examination results or limitations.

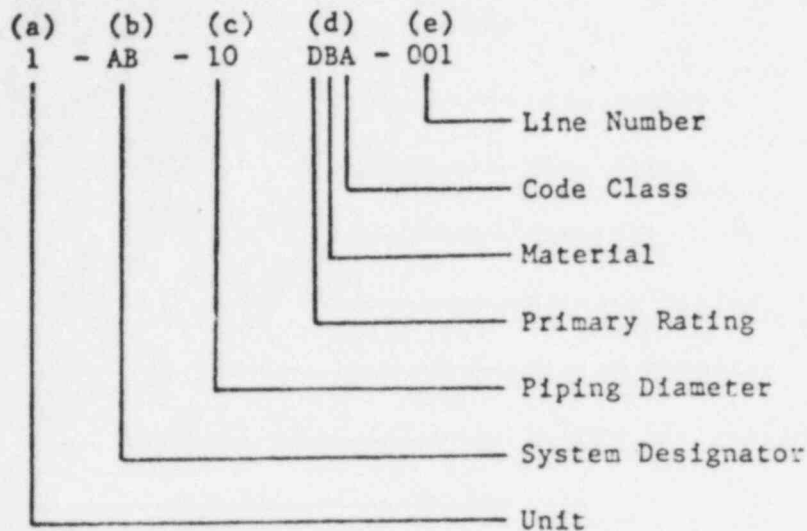
B. Component and System Identification

1. Vessels

All vessel welds and components are identified utilizing a unique component abbreviation. In the case of the RPV, the abbreviation is followed by a unit designator number. Following the component abbreviation is a unique examination area number. The first number of the set denotes the component code class.

2. Piping

The following is a description for the piping numbering scheme.



(a) The first character denotes the unit.

(b) The second character set in each code consists of an abbreviation which designates the applicable piping system. These abbreviations and their respective systems are the same as the Bechtel abbreviations.

(c) The third character set in each code consists of the nominal pipe diameter.

(d) The fourth character set denotes the respective pipe pressure/temperature rating, material and code class, as provided in the Bechtel Line Index for Hope Creek Generating Station. The Bechtel Material Specification provides the corresponding ratings, material, and code class.

(e) The fifth character set denotes a unique line designation corresponding to the Bechtel Line Designation.

Specific examination areas for each piping line are designated under the applicable line number. The weld number assigned to the specific weld or examination area number corresponds to the numbers assigned on the piping isometrics. Weld numbers have been assigned in sequential order in the direction of flow. Branch connections, lugs, hangers, etc. have been identified utilizing the corresponding weld numbers directly upstream of the examination area.

3. Pumps

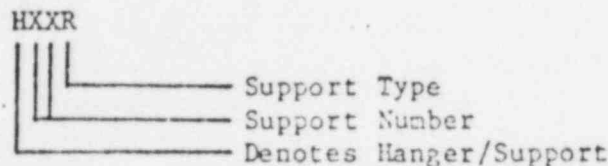
For the reactor recirculation pump components, the area identifications consist of component descriptions and are readily identifiable.

4. Support Components

Support components are identified on the isometrics only using the Bechtel-supplied Hanger Information and abbreviations. The following types of support components require VT-4 examination in addition to the VT-3 examination in accordance with the requirements of Section XI.

- (a) Variable Spring Type - V
- (b) Constant Support - C
- (c) Snubber - X
- (d) Sway Suppressor - S
- (e) Hydraulic Suppressor - H

The hanger description is depicted by the following support numbering scheme on the isometrics.



5. Examination Area Locator System

Examination areas can readily be located by referring to the piping isometrics in Appendices A and B of Volume II. The examination area locations have been identified on the bottom of the isometrics. The area code corresponds to the Bechtel plant layout diagram (PL-1) in Volume II (Appendix D). Additional figures are provided layout to aid in the identification of specific areas as may be applicable.

6. Exceptions Taken to Section XI

As discussed in the introduction, SWRI has prepared this examination plan in accordance with the requirements of the 1977 Edition of Section XI with Addenda through Summer 1978 and other regulatory documents.

SWRI experience during PSIs has shown that design changes and field modifications during the final stages of construction also result in limitations that may require request for relief. The limitations identified in the PSI report should be used for developing relief requests for subsequent Inservice Inspections as required.

III. BASIS FOR PREPARATION

A. Boundary Selection Criteria

For PSI purposes, the Hope Creek Generating Station's ASME Code Classes 1 and 2 "safety-related" piping systems were initially selected from the Bechtel Line Designation List and the piping and instrumentation drawings. Appendix J provides a detailed listing of all Class 1 and Class 2 piping and components, which defines the exemption criteria used where applicable.

B. Class 1 Systems and Components

Class 1 systems and components were selected based on the requirements of ASME Section XI 1977 Edition/S78.

Class 1 components were considered exempt from NDE activities (other than pressure tests) if they met the exemption criteria of IWB-1220 of the 1977 Edition/S78:

<u>Component</u>	<u>Section XI Exemption Criteria</u>
Components connected to and part of the reactor coolant pressure boundary exempted under the makeup requirement criteria	IWB-1220 (a)
All 1" and smaller Class 1 Piping	IWB-1220 (b)
Reactor vessel head connections and associated piping, 2" nominal pipe size and smaller, made inaccessible by control rod drive penetrations	IWB-1220 (c)

C. Class 2 Systems and Components

The Class 2 systems and components were incorporated into the Tables with modifications to the RHR and ECCS as required by 10CFR50.55a (b)(2). Class 2 piping welds in systems other than the RHR and ECCS have been selected in accordance with the requirements of Examination Category C-F, "Notes for Boiling Water Reactors." Class 2 piping welds not selected for examination have been identified in the plan tables with the notation in the remarks section, "Not Selected."

Class 2 components were considered exempt from NDE activities (other than pressure tests) if they met the exemption criteria of IWC-1220 of the 1977 Edition/S 1978 (1974 Edition/S 1975 for RHR, CSS, and ECCS piping):

Component

Section XI Exemption Criteria

Containment Spray System Piping

IWC-1220(b) 1974 Edition/S75

All 4" and smaller Class 2 Piping

IWC-1220(c),
IWC-1220(d) 1974 Edition/S75

All piping (except for RHR and ECCS)
and components with operating
temperature ≤ 200 degrees F and
operating pressure ≤ 275 PSIG

IWC-1220(b)

All RHR and ECCS piping with a
design temperature ≤ 200 degrees F
and a design pressure ≤ 275 PSIG

IWC-1220(a) 1974 Edition/S75

HOPE CREEK GENERATING STATION, UNIT 1
PRESERVICE EXAMINATION PLAN
CLASS 2 COMPONENTS

PAGE 539

HIGH PRESSURE COOLANT INJECTION SYSTEM PIPING (FIGURES LISTED BELOW)

(CONT'D)

ASME SECT XI ITEM NO	ASME SECT XI CATY	WELD NUMBER AND/OR EXAMINATION AREA IDENTIFICATION	EXAM. METHOD	SWRI PROCEDURE NO./REV.	SUMMARY SHEET NUMBER	N I O O M G T R S E H E I O E C G M R	REMARKS
LINE 1-HJ-14DHD-003H (FIGURE D-45)							
CS.21	C-F	1 VALVE TO PIPE	MT UTOL UT45 UT45T	300-1/23 600-41/4	211650		***BASIC CALIBRATION BLOCK*** 14-CS-100-.938-18-HPC
CS.21	C-F	2 PIPE TO FLANGE	MT UTOL UT45 UT45T	300-1/23 600-41/4	211655		***BASIC CALIBRATION BLOCK*** 14-CS-100-.938-18-HPC
CS.21	C-F	3 FLANGE TO PIPE	MT UTOL UT45 UT45T	300-1/23 600-41/4	211660		***BASIC CALIBRATION BLOCK*** 14-CS-100-.938-18-HPC
CS.21	C-F	4 PIPE TO ELBOW	MT UTOL UT45 UT45T	300-1/23 600-41/4	211665		***BASIC CALIBRATION BLOCK*** 14-CS-100-.938-18-HPC
CS.21	C-F	5 ELBOW TO PIPE	MT UTOL UT45 UT45T	300-1/23 600-41/4	211670		***BASIC CALIBRATION BLOCK*** 14-CS-100-.938-18-HPC

EXAMINATION PLAN FOR THE PRESERVICE EXAMINATION
OF SELECTED COMPONENTS AND PIPING OF
THE HOPE CREEK GENERATING STATION, UNIT 1

VOLUME II
EXAMINATION PLAN APPENDICES
SwRI Project 17-3690

Prepared for

Public Service Electric and Gas Company
80 Park Plaza
Newark, New Jersey 07101

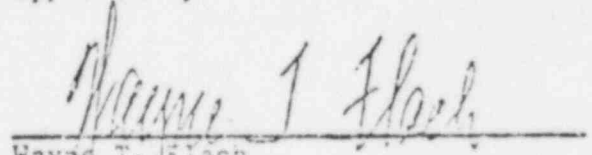
February 1984

Prepared by



Edward J. Feigen
Project Engineer
Inspection Engineering
Section

Approved by



Wayne T. Flach
Director
Department of Engineering Services
Quality Assurance Systems and
Engineering Division

APPENDIX B

CLASS 2 ¹ ISOMETRIC DRAWINGS

APPENDIX B

CLASS 2 ISOMETRIC DRAWINGS

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APPENDIX B

CLASS 2 ISOMETRIC DRAWINGS

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APPENDIX E

NONDESTRUCTIVE TESTING PROCEDURES

APPENDIX E
NONDESTRUCTIVE TESTING PROCEDURES

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SWRI-NDT-300-2/30	Fluorescent Magnetic Particle Examination
SWRI-NDT-600-5/36	Manual Ultrasonic Examination of Nuclear Reactor Pressure Vessel Flange Ligaments
SWRI-NDT-600-11/37	Manual Ultrasonic Examination of Vessel-to-Nozzle Inner Radius Sections
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SWRI-NDT-800-36/27	Manual Ultrasonic Examination of Austenitic Thin Wall Piping Welds
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NUCLEAR PROJECTS
OPERATING PROCEDURE

SWRI-NDT-300-1
Revision 23
July 1981

Page 1 of 10

Title

DRY POWDER MAGNETIC PARTICLE EXAMINATION

EFFECTIVITY AND APPROVAL

Revision 23 of this procedure became effective on 29 July 1981. Other revisions of the base document may be effective concurrently.

SA

A.R.

Approvals

Written By

DW Fournell

Date

21 July 81

Technical Review

Paul A. Godwin

Date

27 July 81

Manager of Q.A.

Samuel M. Smith

Date

28 July 81

Assistant Director

Walter J. Hall

Date

1/28/81

The following information may be used for convenience. Completion of this portion is not mandatory.

Deviation No.

Date Effective

Procedure Section(s)
Affected

Notes:

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

SwRI-NDT-300-1
Revision 23
July 1981

Page 2 of 10

DRY POWDER MAGNETIC PARTICLE EXAMINATION

SwRI-NDT-300-1

1.0 PURPOSE

This procedure provides the technical information and detailed steps required to ensure proper dry powder magnetic particle examinations of ferromagnetic materials in accordance with the applicable ASME Boiler and Pressure Vessel Codes.

2.0 SCOPE AND APPLICATION

- (1) This procedure shall be utilized for the dry powder magnetic particle examination of ferromagnetic materials employing alternating current (AC) yoke techniques.
- (2) Areas to be examined shall be components, longitudinal and circumferential welds, butt and fillet welds of branch connections, and support attachments as specified in the applicable SwRI Examination Plan.

2.1 Applicable Documents

The following documents form a part of this procedure as applicable:

- (1) ASME Boiler and Pressure Vessel Code, Section XI, 1977 Edition, with Addenda through Summer 1978, "Rules for Inservice Inspection of Nuclear Power Plant Components."
- (2) ASME Boiler and Pressure Vessel Code, Section V, 1977 Edition, with Addenda through Summer 1978, "Nondestructive Examination."
- (3) SwRI Nuclear Quality Assurance Program Manual (NQAPM).

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NUCLEAR PROJECTS OPERATING PROCEDURE

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July 1981

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3.0 RESPONSIBILITY

- (1) The Director of the Department of Engineering Services, Quality Assurance Systems and Engineering Division, shall be responsible for the preparation, review, approval, and control of this procedure.
- (2) The Project Manager shall be responsible for the implementation of this procedure in accordance with the NQAPM specified in the applicable SWRI Project Plan.
- (3) The examiner shall be responsible for implementing the requirements of this procedure.
- (4) The Manager of Support and Administration Section of the Quality Assurance Systems and Engineering Division, shall be responsible for storage of records generated in accordance with this procedure.

4.0 CODE AND PROCEDURE REQUIREMENTS

The requirements listed below shall be applied when performing dry powder magnetic particle examinations.

<u>Requirements</u>	<u>Section</u>
(1) Materials, shapes, or sizes to be examined	2.0 & 7.0
(2) Type of magnetization to be used	5.0
(3) Equipment	5.0
(4) Surface preparation (finishing and cleaning)	7.0
(5) Ferromagnetic particles to be used	5.0
(6) Magnetization current	2.0 & 5.0
(7) Demagnetization	7.0

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NUCLEAR PROJECTS OPERATING PROCEDURE

SWRI-NDT-300-1
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July 1981

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- | | | |
|-----|-------------------------|-----|
| (8) | Coverage | 7.0 |
| (9) | Personnel Certification | 5.0 |

5.0 PERSONNEL AND EQUIPMENT

5.1 Personnel Certification

Personnel shall be certified in accordance with SwRI NQAF 11-1, "Special Process Control."

5.2 Equipment

- (1) AC electromagnetic yokes with a minimum lifting power of 10 pounds with a pole spacing of 3 to 6 inches shall be used.
- (2) Dry magnetic particles shall be utilized as the examination medium. The color selected shall provide adequate contrast with the background of the examination area.
- (3) Dry magnetic particles shall be selected from the following:
 - (a) Magnaflux Red No. 8A Powder
 - (b) Magnaflux Gray No. 1 Powder
 - (c) Magnaflux Black No. 3A Powder
 - (d) Dry magnetic particles equivalent to those specified above may be used.
- (4) Devices normally used for application of dry magnetic particles are listed below.
 - (a) Magnetic Particle Puffer Bottle, Model PB-1.
 - (b) Magnaflux Pneumatic Applicator.



SOUTHWEST RESEARCH INSTITUTE
NUCLEAR PROJECTS
OPERATING PROCEDURE

SwRI-NDT-600-41
Revision 4
March 1982
Page 1 of 17

Title

MANUAL ULTRASONIC EXAMINATION OF FERRITIC PRESSURE PIPING WELDS

EFFECTIVITY AND APPROVAL

Revision 4 of this procedure became effective on 4/16/82. Other revisions of the base document may be effective concurrently.

SA

CK

Approvals

Written By

DW Fourwell

Date

3/18/82

Technical Review

John Walker

Date

April 14, 1982

Manager of QA

Bruce McInnis

Date

4/21/82

Cognizant Director

Wanda J. Lach

Date

4/16/82

The following information may be used for convenience. Completion of this portion is not mandatory.

Deviation No.

Date Effective

Procedure Section(s)
Affected

Notes:

SOUTHWEST RESEARCH INSTITUTE



NUCLEAR PROJECTS OPERATING PROCEDURE

SwRI-NDT-600-41
Revision 4
March 1982

Page 2 of 17

MANUAL ULTRASONIC EXAMINATION OF FERRITIC PRESSURE PIPING WELDS

SwRI-NDT-600-41

1. PURPOSE

This procedure provides the technical information and detailed steps necessary to ensure a complete and accurate manual ultrasonic examination of ferritic pressure piping welds and the adjacent base material in accordance with the applicable ASME Boiler and Pressure Vessel Code.

2. SCOPE AND APPLICATION

Class 1 and Class 2 full-penetration pressure piping butt welds and the adjacent base material in the nominal thickness range of 0.2 to 6.0 inches shall be examined.

Manual, contact, pulse-echo, shear-wave angle-beam, and longitudinal-wave straight-beam ultrasonic techniques shall be utilized for the examination of clad or unclad piping welds and adjacent base material.

Welds to be examined shall be circumferential and longitudinal ferritic pipe welds as specified in the applicable SwRI Examination Plan.

3. APPLICABLE DOCUMENTS

- (1) ASME Boiler and Pressure Vessel Code, Section XI, 1977 Edition, with Addenda through Summer 1978, "Rules for Inservice Inspection of Nuclear Power Plant Components"
- (2) SwRI Nuclear Quality Assurance Program Manual (NQAPM)

3.1 Applicable Calibration and Examination Records

<u>SwRI-NDTR Form No.</u>	<u>Revision Date</u>
17-89	8-19-80
17-90	8-19-80
17-25	7-10-80
17-19	7-10-80
17-18	7-31-75
17-37	2-18-80

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NUCLEAR PROJECTS OPERATING PROCEDURE

SWRI-NDT-600-41
Revision 4
March 1982

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4. RESPONSIBILITY

- (1) The Director of the Department of Engineering Services, Quality Assurance Systems and Engineering Division, shall be responsible for the preparation, review, approval, and control of this procedure.
- (2) The Project Manager shall be responsible for the implementation of this procedure in accordance with the NQAPM specified in the applicable SWRI Project Plan.
- (3) The examiner shall be responsible for implementing the requirements of this procedure.
- (4) The Manager of the Support and Administration Section, Quality Assurance Systems and Engineering Division, shall be responsible for storage of records generated in accordance with this procedure.

5. PERSONNEL AND EQUIPMENT

5.1 Personnel Certification

Personnel performing examinations in accordance with this procedure shall be certified in accordance with SWRI NQAP 11-1, "Special Process Control."

5.2 Reference Block

Reference blocks used for screen distance calibration and verification shall be made of carbon steel and shall be one of the following: (1) SWRI Half-Round, (2) AWS Type DC, or (3) IIW.

5.3 Basic Calibration Block for Circumferential and Longitudinal Welds

The basic calibration block shall be fabricated from material of the same nominal diameter and wall thickness or pipe schedule as the pipe to be examined. This material shall be from one of the materials specified for the piping being joined by the weld. The finish on the surfaces of the basic calibration block shall be representative of the surface finishes of the piping.

When the examination is to be performed from only one side of the weld, the calibration block material shall be of the same specification as the material on that side of the weld. If material of the same specification is not available, material of similar chemical analysis, tensile properties, and metallurgical structure may be used.

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NUCLEAR PROJECTS OPERATING PROCEDURE

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Calibration reflectors for 12/8 vee-path ("N" path) calibrations shall be notches machined on the outside and inside surfaces of the basic calibration block. The notches shall be in accordance with approved drawings of the basic calibration block and Appendix III of Section XI.

Calibration reflectors for 1/2 vee-path examinations shall be a minimum of two equal-diameter, axially drilled holes located at 1/4T and 3/4T, and the inside surface notch.

Approved drawings of basic calibration blocks to be used in accordance with this procedure are in the applicable SwRI Examination Plan.

5.4

Search Units

- (1) The search unit size shall be selected according to the following table:

(a) Straight-Beam

<u>Nominal Production Material Thickness</u>	<u>Nominal Search Unit Size</u>
2.0" or less	1/4" Round
1.0" to 3.0"	3/8" Round
2.0" to 4.0"	1/2" Round
3.0" to 6.0"	3/4" or 1" Round

(b) Angle-Beam

<u>Nominal Production Material Thickness</u>	<u>Nominal Search Unit Size</u>
1.0" or less	1/4" x 1/4", 1/4" Round
0.4" to 2.0"	3/8" x 3/8", 3/8" Round
0.75" to 4.0"	1/2" x 1/2", 1/2" Round
2.0" to 6.0"	1/2" x 1", 3/4" Round

- (2) The search unit wedges shall be fabricated as required to produce $45^\circ \pm 2^\circ$ or $60^\circ \pm 2^\circ$ refracted shear-waves.
- (3) The exit point of the sound beam and the actual refracted beam angle of shear-wave search units shall be determined on an IIW block. The exit point shall be marked on the search unit wedge.



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NUCLEAR PROJECTS
OPERATING PROCEDURE

SWRI-NDT-900-7
Revision 3
March 1981

Page 1 of 9

Title

VISUAL EXAMINATION OF NUCLEAR REACTORS

EFFECTIVITY AND APPROVAL

Revision 3 of this procedure became effective on 3/17/81. Other revisions of the base document may be effective concurrently.

SA

Approvals

Written By

W. J. Henner

Date

*11
12 Mar 81*

Technical Review

Steve Walker

Date

*Mar. 13,
1981*

Manager of Q.A.

R. E. Engelhardt

Date

3/17/81

Coordinating Director

William J. Hall

Date

3/17/81

The following information may be used for convenience. Completion of this portion is not mandatory.

Deviation No.

Date Effective

Procedure Section(s)
Affected

Notes:

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NUCLEAR PROJECTS OPERATING PROCEDURE

SwRI-NDT-900-7
Revision 3
March 1981

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VISUAL EXAMINATION OF NUCLEAR REACTORS

SwRI-NDT-900-7

1.0 PURPOSE

This procedure provides the technical information and detailed steps required to ensure the proper visual examination of nuclear power plants in accordance with the applicable ASME Boiler and Pressure Vessel Codes.

2.0 SCOPE AND APPLICATION

Direct and remote visual techniques shall be applied as specified for the examination of:

- (1) Nuclear power plant components.
- (2) Nuclear reactor internals.
- (3) Support members and structures for piping, valves and pumps.

2.1 Applicable Documents

The following documents form a part of this procedure, as applicable:

- (1) ASME Boiler and Pressure Vessel Code, Section XI, 1977 Edition, with Addenda through Summer 1978, "Rules for Inservice Inspection of Nuclear Power Plant Components."
- (2) SwRI Nuclear Quality Assurance Program Manual (NQAPM).

3.0 RESPONSIBILITY

- (1) The Director of the Department of Engineering Services, Quality Assurance Systems and Engineering Division, shall be responsible for the preparation, review, approval, and control of this procedure.

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NUCLEAR PROJECTS OPERATING PROCEDURE

SwRI-NDT-900-7
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- (2) The Project Manager shall be responsible for the implementation of this procedure in accordance with the NQAPM specified in the applicable SwRI Project Plan.
- (3) The examiner shall be responsible for implementing the requirements of this procedure.
- (4) The Manager of the Support and Administration Section of the Quality Assurance Systems and Engineering Division shall be responsible for storage of records generated in accordance with this procedure.

4.0 CODE AND PROCEDURE REQUIREMENTS

The requirements listed below shall apply when performing visual examinations in accordance with this procedure.

<u>Requirements</u>	<u>Section</u>
(1) Personnel certification	5.0
(2) Examination area	7.0
(3) Surface condition and cleaning requirements	6.0
(4) Examination method	6.0
(5) Equipment	5.0
(6) Lighting requirements	6.0
(7) Resolution	6.0

5.0 PERSONNEL AND EQUIPMENT

Personnel performing examinations shall be certified in accordance with SwRI NQAP 11-2, "Procedure For Certifying Visual Examination Personnel."

The Visual Examination Acceptability Test Card shall be made from Kodak Neutral Test Card No. R-27 or an equivalent, with an 18% neutral grey side having a 1/32-inch-wide black line down the center.

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NUCLEAR PROJECTS OPERATING PROCEDURE

SwRI-NDT-900-7
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March 1981

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Commercially available equipment shall be used as required for the performance of examinations or operations by the techniques described in Paragraphs 6.1, 6.2, 6.3, and 6.4.

6.0 EXAMINATION METHODS

6.1 VT-1 Examinations

The examiner shall determine the condition of the part, component or surface, with respect to cracks, wear, corrosion, erosion or physical damage to the surface of the part or component.

6.1.1 Direct Visual

Direct visual examination shall be performed by placing the eye within 24 inches of the surface to be examined and at an angle no less than 30 degrees with the surface to be examined. Mirrors may be used to improve the angle of vision, and aids such as magnifying lenses may be used.

In addition to the general lighting, illumination of the area to be examined shall be provided at right and oblique angles to expose cracks or evidence of corrosion or erosion.

Resolution shall be considered adequate when the combination of access, lighting, and angles of vision, either unaided or corrected, can resolve a black line, 1/32-inch-wide, on an 18% neutral grey card placed on the surface to be examined.

6.1.2 Remote Visual Technique

Remote visual examination may be used where conditions exist that do not permit direct visual examination. Remote visual examination may include visual aids such as telescopes, periscopes, borescopes, fiber optics, or TV cameras and monitoring systems, with or without attachments for permanent recording. Remote techniques shall demonstrate the ability to provide a resolution at least equivalent to that obtainable by direct visual examination. Mirrors, movable lights, or rotating optics, or any combination thereof, may be employed to display cracks, surface scratches, or evidence of corrosion, erosion, misalignment, or movement.

EXAMINATION PLAN FOR THE PRESERVICE EXAMINATION
OF SELECTED COMPONENTS AND PIPING OF
THE HOPE CREEK GENERATING STATION, UNIT 1

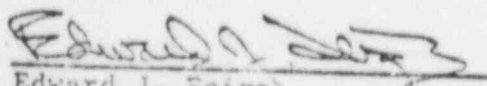
VOLUME III
APPENDICES (CONT'D)
SwRI Project 17-3690

Prepared for

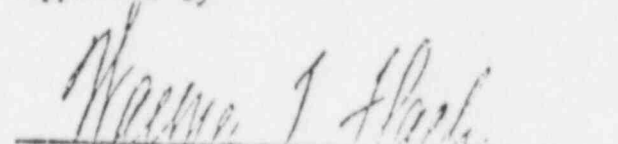
Public Service Electric and Gas Company
80 Park Plaza
Newark, New Jersey 07101

February 1984

Prepared by


Edward J. Feige
Project Engineer
Inspection Engineering
Section

Approved by


Wayne T. Flach
Director
Department of Engineering Services
Quality Assurance Systems and
Engineering Division

APPENDIX I

HYDROSTATIC AND LEAK TEST REQUIREMENTS

HOPE CREEK GENERATING STATION, UNIT 1
PRESERVICE INSPECTION PLAN
CLASS 2 PRESSURE RETAINING BOUNDARY TEST REQUIREMENTS

PAGE 155

HIGH PRESSURE COOLANT INJECTION (HJ)

ASME ITEM NO	ASME SECT XI CATEY	WELD NUMBER AND/OR EXAMINATION AREA IDENTIFICATION	EXAM. METHOD	SHRT PROCEDURE NO./REV.	SUMMARY SHEET NUMBER	NOTES	REMARKS
C7.40	C-H	M.O. GATE VALVE V002	VT-2/LT	900-7/3	317450		
C7.41	C-H	M.O. GATE VALVE V002	VT-2/HT	900-7/3	317460		
C7.40	C-H	M.O. GATE VALVE AP-V004	VT-2/LT	900-7/3	317470		
C7.41	C-H	M.O. GATE VALVE AP-V004	VT-2/HT	900-7/3	317480		
C7.40	C-H	M.O. GATE VALVE FD-V006	VT-2/LT	900-7/3	317490		
C7.41	C-H	M.O. GATE VALVE FD-V006	VT-2/HT	900-7/3	317500		
C7.40	C-H	M.O. GATE VALVE FD-V003	VT-2/LT	900-7/3	317510		
C7.41	C-H	M.O. GATE VALVE FD-V003	VT-2/HT	900-7/3	317520		
C7.40	C-H	M.O. GLOBE VALVE V010	VT-2/LT	900-7/3	317530		

HOPE CREEK GENERATING STATION, UNIT 1
PRESERVICE INSPECTION PLAN
CLASS 3 PRESSURE RETAINING BOUNDARY TEST REQUIREMENTS

PAGE 221

MAIN STEAM SYSTEM (AB)

(CONT'D)

ASME SECT XI ITLN NO	ASME SECT XI CATGY	WELD NUMBER AND/OR EXAMINATION AREA IDENTIFICATION	EXAM. METHOD	SWRI PROCEDURE NO./REV.	SUMMARY SHEET NUMBER	N I O O N G T N S E H E I O E C G M R	REMARKS
----	----	1-AII--**HCC-195	VT-2/LT VT-2/HT	900-7/3	330010	-----	-----
----	----	1-AII--**HCC-196	VT-2/LT VT-2/HT	900-7/3	330020		
----	----	1-AII--**HCC-197	VT-2/LT VT-2/HT	900-7/3	330030		
----	----	1-AII--**HCC-198	VT-2/LT VT-2/HT	900-7/3	330040		
----	----	1-AII--**HCC-199	VT-2/LT VT-2/HT	900-7/3	330050		
----	----	1-AII--**HCC-200	VT-2/LT VT-2/HT	900-7/3	330060		
----	----	1-AII--**HCC-201	VT-2/LT VT-2/HT	900-7/3	330070		
----	----	1-AII--**HCC-202	VT-2/LT VT-2/HT	900-7/3	330080		
----	----	1-AII--**HCC-203	VT-2/LT VT-2/HT	900-7/3	330090		

RESOLUTION/COMPLETION REPORT

OR No. 28 Rev. 0 Date 5/21/85
R/CR No. 28 Rev. 0 Date 5/31/85

1. Classification of Observation (by S&L):
 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

CB JCOesterick for Rust
Discipline Group Supervisor,

5-30-85
Date

[Signature]
Bechtel Project Engineer

5/31/85
Date

4. Public Service Electric and Gas Company review:

SRS [Signature]
Chief Project Engineer

5-31-85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 28 Rev. 0 Date 5/21/85
R/CR No. 28 Rev. 0 Date 5/21/85

Following is our response to the recommendation for resolution:

- 4.a Specification 10855-G-099 (Technical Specification for Internal Cleanliness of Piping and Equipment) defines the applicable cleanliness requirements for NSSS and non-NSSS piping and equipment and references the applicable GE cleanliness specification 22A2537 for the NSSS portions. The above specifications are in compliance with ANSI N45.2.1-1973. Design Specification M-068 will be revised to reflect these requirements.
- 4.b Construction activities are in accordance with the requirements of 10855-G-099 and 22A2537, as evidenced by field specific work plan and SWP-54 and Quality Control and Inspection Plan QCI-110. A copy of these documents will be transmitted separately to S&L by June 7, 1985.
- 4c Specification 10855-M-068, Rev.2, reflects the GE specification 22A1300BE9 for cleaning requirements for NSSS piping and equipment in general terms. Specific requirements for field cleanliness of the NSSS portions have been defined in GE specification 22A2537, and these specific requirements have been incorporated in the appropriate Bechtel documents. Specification M-068 has been in the process of revision to incorporate the current project commitments. As described in 4.a, b and c above, the delayed revision of Design Specification M-068 has not resulted in any licensing, design or construction impact.

In general, design specifications are prepared as a basis for the initial design and are revised periodically to reflect changes in the design requirements as the design process continues. While certain inconsistencies between the design specification and the actual design may exist from one revision to the next, the actual design will reflect the current requirements which are implemented as a result of FSAR commitments, field changes, GE documentation changes, etc. Prior to completing the final design, any differences between the design specification and the as-built design will be reconciled.

OKS
FOR RESOLUTION OF OR420

HOPE CREEK GENERATING STATION

BECHTEL CONSTRUCTION, INC.

JOB 10855

SPECIFIC WORK PLAN/PROCEDURE

SWP/P-54

INSTALLATION OF PROCESS PIPE SYSTEMS

CONTROLLED DISTRIBUTION
THIS PRINT ASSIGNED TO 11/19/91

Safety Related Yes ☒ No ☐

Client Interface Yes ☐ No ☒






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18	11.22.85	Revised As Noted	BY	BOOCE	POAE	PREL	ECM	
No.	DATE							
ORIGIN		PUBLIC SERVICE ELECTRIC AND GAS COMPANY HOPE CREEK GENERATING STATION				JOB No. 10855		
		NOR. 1 & 2 UNITS				SWP/P-54		
						SHEET 1 OF 1		

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- 2.0 SCOPE
- 3.0 APPLICATION
-  4.0 REFERENCES
- 5.0 DEFINITIONS
-  6.0 ORGANIZATION AND RESPONSIBILITY
-  7.0 INSTALLATION OPERATIONS
- 8.0 RECORDS

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- A. THERMAL INTERFERENCE WALKDOWNS
-  B. UPGRADING OF MATERIAL FOR USE IN ASME SYSTEMS

EXHIBITS

- A. LARGE PIPE SPOOL INSTALLATION CARD
- B. LARGE PIPE VALVE INSTALLATION CARD
- C. IMPLEMENTATION AND CONTROL WORKSHEET
- D. COMPONENT DISASSEMBLY WORKLIST
- E. 2" AND SMALLER PIPE BEND QUALIFICATIONS AND VERIFICATION INSTRUCTION
- F. SYSTEM ISOMETRICS WHICH REQUIRE P-250 (Q) WPPR'S
- G. FLANGE CARD
- H. ASSOCIATED ITEMS CARD
- I. SMALL PIPE CARD

ATTACHMENTS

- A. PIPE BEND INSPECTION

1.0 PURPOSE

This procedure provides the requirements and guidelines for installation, inspection and documentation of process pipe systems.

2.0 SCOPE

This procedure describes the field organization's scope of responsibilities, engineering requirements, construction requirements and guidelines for the installation of large and small pipe, valves, and in-line components.

3.0 APPLICATION

This procedure applies to all large and small pipe, valves, and in-line components installed by Bechtel.

4.0 REFERENCES

SPECIFIC WORK PLAN/PROCEDURES (SWP/P)

- 4.1 SWP/P-2 -Project Implementation and Control of Construction Specific Work Plan/Procedure Program
- 4.2 SWP/P-8 System Final Punchlist and Turnover
- 4.3 SWP/P-19 -Welding Activities
- 4.4 SWP/P-112 -Preparation of Field Change Orders
- 4.5 SWP/P-5 -Field Change Request/Field Change Notice
- 4.6 SWP/P-124 -Identification Marking and Color Coding System for Field Purchased Material
- 4.7 SWP/P-P-4 -Leak Testing of Piping Systems
- 4.8 SWP/P-P-108-Fabrication, Alteration and Modification of ASME III Nuclear Components
- 4.9 SWP/P-P-109-Control and Application of ASME Code Stamps. Preparation of Code Data Reports
- 4.10 SWP/P-P-110-Purchase, Receipt, Installation, Testing, and Storage Requirements for "F" Listed Systems.

PROJECT SPECIFICATIONS AND DRAWINGS

- 4.11 10855-P-202(Q) -Field Fabrication and Installation of Piping for Nuclear Service
- 4.12 10855-P-203 -Field Fabrication and Installation of Non-Nuclear Piping
- 4.13 10855-P-205(Q) -Piping System Erection Fit-Up Control
- 4.14 10855-G-099(Q) -Cleanliness of Piping System
- 4.15 10855-P-500 -Piping Class Sheets
- 4.16 10855-P-501 -Line Index
- 4.17 10855-P-570 -Welding & Non-Destructive Testing Requirements for Field Erected Piping
- 4.18 10855-C-036 -Installation of Yard Piping
- 4.19 10855-C-049(Q) -Installation of Category I Buried Service Water Pipe and Duct Bank
- 4.20 10855-C-062 -Installation of Circulating Water Pipe

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

- 4.21 ASME Boiler and Pressure Vessel Code, Section III - Division 1, Nuclear Power Plant Components
- 4.22 ASME Boiler and Pressure Vessel Code, Section IX
- 4.23 BQAM - ASME III, Nuclear Components Division I
- 4.24 CQCM - Hope Creek Construction Quality Control Manual

AMERICAN NATIONAL STANDARD INSTITUTE (ANSI)

- 4.25 ANSI B31.1, Power Piping

5.0 DEFINITIONS

- 5.1 In-Line Components - Items such as strainers, orifice plates, venturis, filters, etc.
- 5.2 Type IIA SWP/P - Work Plan/Procedure Record (Exhibit D)

- 5.2.1 - Installation Cards used by field construction to install "In-Line Components" where no Type IIB card exists.
- 5.2.2 - Piping System Erection Fit-up Control WPPR.
- 5.2.3 - Component Disassembly Worklist WPPR.

NOTE: The Lead Field Piping Engineer or his designee that prepares a Type IIA WPPR is the Person-In-Charge of the operation(s) and has responsibility for approving and accepting the end result(s). See entries No. 8, 9, and 19 of SWP/P-2, Appendix B-1. Entries 10 and 11 are N/A due to overall approval of this procedure.

- 5.3 Type II B
SWP/P
 - Installation Cards used by field construction to install specific piping components
 - 5.3.1 - Pipe Spools
 - 5.3.2 - Valves
 - 5.3.3 - Flange points
 - 5.3.4 - Associate Items
 - 5.3.5 - Small Pipe Identities
- 5.4 Piping System
 - All piping and components that are shown on each system isometric including 2" and under pipe, valves, in line components, hangers, supports, and seismic restraints.

6.0 ORGANIZATION AND RESPONSIBILITY

- 6.1 The Field Construction Manager shall assure the implementation of this procedure.
- 6.2 The Project Field Engineer and the Project/Field Superintendent shall administer the functions and responsibilities to implement and control the requirements of this procedure.
- 6.3 The Responsible Field Engineer (RFE) and the Area Piping Superintendent shall be directly responsible for the planning and the installation of piping, valves, and in-line components. The RFE shall prepare Type IIA WPPR cards for piping system erection fit-up control.
- 6.4 The Lead Welding Field Engineer shall assure that the requirements of Welding and NDE are in strict accordance with Project Specifications and Procedures.

- 6.5 The Lead Discipline Engineer (LDE) or his designee is responsible for notifying QC of pending rework on "Q" and "F" listed items/ systems that have been inspected and accepted by QC. The methods for notification are shown in the following matrix:

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Note: QC Notification Matrix On IV below, the QCIR and memo shall be issued essentially concurrent.				
	F N C O R	C C I R	Q E I I A C A P D	T Y P I C A TAG
I Modification of Vendor Supplied Item	X		X	X
A. Due to design change	X		X	X
B. Due to interference (memo to cut out)	X			X
C. Cut out shop weld for any reason	X			X
D. Additional bosses for vents & drains	X			X
II Repair of Vendor Supplied Item		X		
A. Indication in material/welds		X		
B. Mechanical damage to item or appurt		X		
III Design Change - 2" and Under Piping			X	X
A. Rerouted piping				X
B. Added valves or in-line items				X
C. Deleted valves or in-line items				X
D. Due to interferences				X
IV Cut Out of Field Welds	X	X		X

- 6.6 The old card(s) shall be retained for documentation of items not reworked (if applicable). Upon acceptance of the rework by FE, a copy of the new card, FCO, or speedy memo shall be sent to (C).

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7.0 INSTALLATION OPERATION

- 7.1 The RFE and the Piping Superintendent shall review SWP/P's, Construction Performance Standards, Project drawings and specification, codes and standards, etc., applicable to piping components.
- 7.2 The RFE and Piping Superintendent shall ensure that the latest revision of all applicable engineering documents are available, including FCR's, FCN's, and DCN's and that no "HOLDS" exist on documents that would restrict the work activity. They shall check the disposition of any open NCR's for additional inspection requirements.

- 7.3 The RFE and Piping Superintendent shall coordinate the work with QC and other disciplines as required before and during the installation of piping components.
- 7.4 The RFE and the Piping Superintendent shall ensure that the requisites for commencing work, and the controls during the work, are adhered to in accordance with SWP/P-2.
- 7.5 The RFE shall ensure that all material for the installation is on site and shall provide installation details, FSK's, FCO's, etc., when required.
- 7.6 The RFE shall obtain the appropriate Type II B Installation Cards for the components to be installed.

NOTE: Installation of piping components, e.g., in-line components, for which no Installation Cards are provided, a Type IIA Specific Work Plan/Procedure Record shall be prepared in accordance with SWP/P-2.

QC does not put hold points on Type II B cards; therefore, they are not transmitted to QC prior to start of installation.

- 7.7 Systems shall be installed in accordance with 10855-P-205. Systems which require all or a portion of the piping to be installed per 10855-P-205 are listed in Exhibit "F".

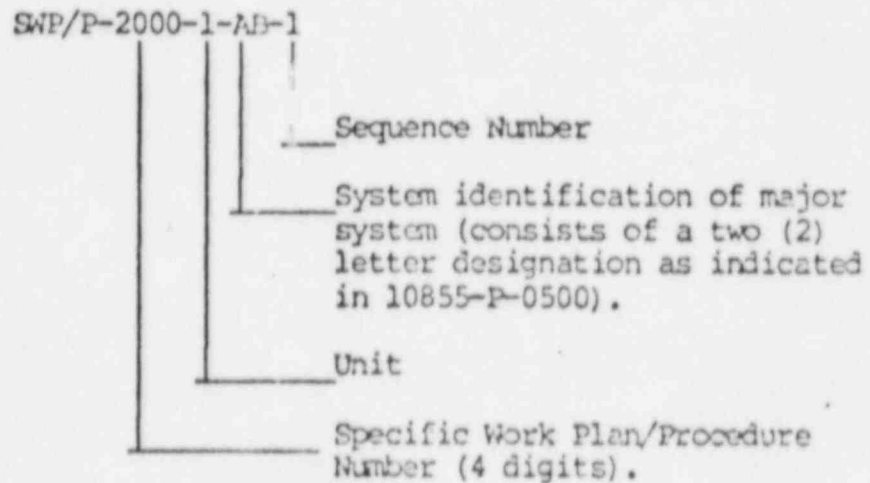
Lines identified in 10855-P-205 as Closure-Spool-Controlled or Engineer Verified Closure shall be documented via Type II A Specific Work Plan/Procedure records.

For any piping run which attaches to rotating equipment, the Responsible Field Piping/Hanger Engineer(s) shall sign the Mechanical Equipment WPPR sheet (ref. SWP/P-53, Appendix "A", sequence 100) prior to alignment activities commencing, indicating that the piping/hanger system is in a complete strain-free state and is in accordance with 10855-P-205.

This is to include, as a minimum, the first 3 load bearing hangers from the equipment.

Any deviations (misfits) not acceptable per 10855-P-205 shall be either reworked via an FCO or accepted by Project Engineering prior to closure via an FCR. Any pipe strain or flange angularity or parallelism mismatch to equipment connections, which prevent an acceptable final alignment, must be reworked via FCO until an acceptable final alignment closure is obtained.

7.7.1 Each record shall be assigned numbers as follows:



A log of records shall be maintained by the Lead Field Piping Engineer.

7.8 Weld end valves, in accordance with P-202(Q) and P-202, shall be installed with the disc/plug in the position preferred by the manufacturer. The manufacturer's common to this project and preferred position is:

7.8.1	Manufacturer	Type	Position
	Anchor/Darling	Large Nuclear Valves	Open
	Pacific Valves	Large Non-Nuclear Valves	Closed
	Rockwell	Small Nuclear Valves	Closed
	Dresser	Small Non-Nuclear Valves	Open
	Masoneilan	Control Valves	Either
	Dresser Hancock	Small Nuclear Valves	Open & Backseated

7.8.2 For valves not listed above, the disc/plug position shall be in accordance with specification P-202(Q):

- 2" and smaller valves - closed
- 2 1/2" and larger valves - open

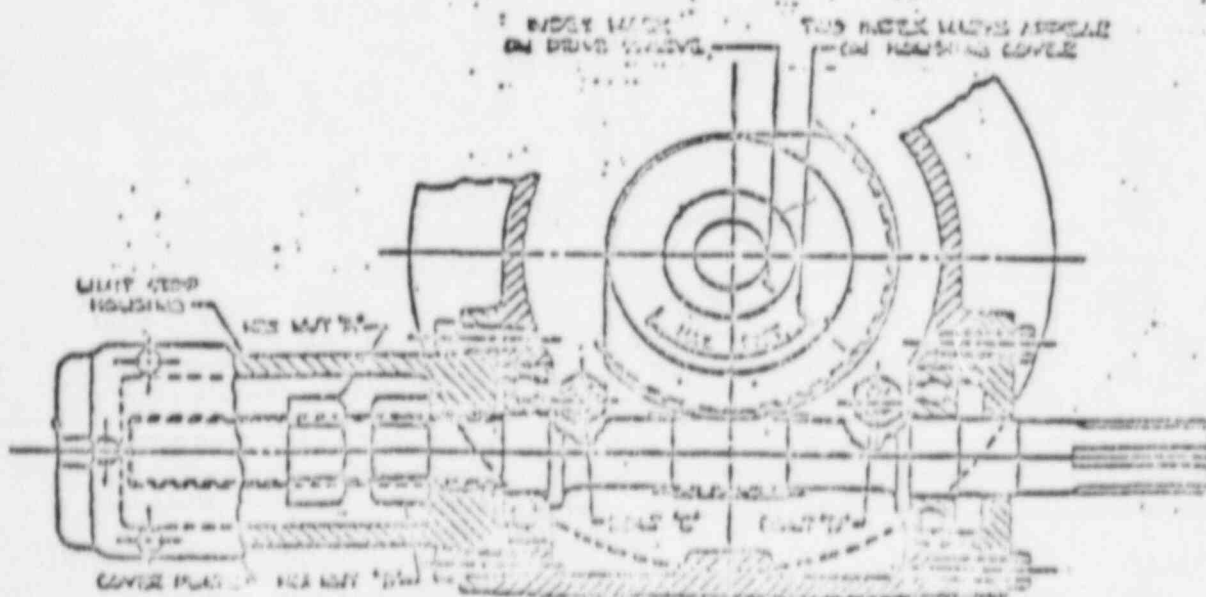
7.8.3 The preferred mounting position for valve motor operators is either of the following:

- 1) Valve stem and motor shaft in the horizontal position and limit switch compartment vertically up.
- 2) Valve stem vertical, motor shaft horizontal, and the limit switch compartment cover facing to the side or vertically up.

Unless approved by Project Engineering, it is not acceptable for the limit switch compartment to be placed facing downward. The centerline at the valve body should not be above the centerline of the operator.

7.8.4 Field assembly of Limitorque H0BC, H1BC, H2DC, and H3BC operators may result in a misalignment allowing the worm gear segment to rotate beyond it's engagement with the worm shaft. As such, the following caution shall be implemented when assembling/re-assembling the reference operators:

HEX-NUT TYPE STOP (H0C-0 THRU 5)



CAUTION: To avoid disengaging the worm gear segment insure that the index mark on the drive sleeve (center line of gear segment) is oriented to the mid-point of the full valve travel. Full stroke motion of this index mark should not move past the corresponding travel line index marks on the housing cover. Should the housing cover index marks not be visible—the two housing cover index (C & D) can be used for this alignment.

- 7.9 The RFE shall provide technical guidance during installation activities and initiate appropriate change action if any conflicts exist between engineering documents and the installation of piping components. Changes to ASME components shall be in accordance with SWP/P-P-108.
- 7.10 When ASME components are embedded in concrete, or are otherwise inaccessible, the RFE shall:
- 1) Prepare an FCO delineating the transfer of the "N" serial number on vendor supplied spools to that portion of the component or system which is accessible.
 - 2) Document all verified heat numbers/codes of Field purchased items on the FCO or Field Weld Mark-up prior to the item becoming inaccessible.
- 7.11 When transferring the "N" stamp serial no., (as in 7.10) the RFE shall make a "rubbing" of the code plate and attach a copy of the "rubbing" to the FCO. A copy of the FCO and "rubbing" shall be transmitted to the PQCE.
- 7.11.1 In cases where a "rubbing" is not possible, the R.F.E. shall use the vendor's NFP-1 form to verify spool heat and serial numbers. This shall be documented by attaching a copy of the NFP-1 Spool Sketch (with heat and serial numbers) and FCO (if applicable) to an FER.
- 7.12 The RFE shall assure that transfer of the "N" stamp serial no., and documentation of same is witnessed or verified by the Authorized Nuclear Inspector (ANI). This signature may appear on a FER or an FCO.
- 17 7.13 The FCO or design drawing on large pipe, and the design drawing, on small pipe, are the documents used to verify and document material traceability for work performed by the field or by the CGPS.
- 7.14 The RFE shall verify the following aspects related to Field Cold Bending of Non-Q 2" and smaller piping.
- 7.14.1 The bend radius is approximately 5 times nominal pipe diameter as specified in tech. specs. P-202 and P-203.
 - 7.14.2 That ovality is maintained in accordance with the applicable code (ASME III or ANSI B31.1).

- 7.14.3 That minimum wall thickness is maintained as specified by SFHO Engineering.

This verification shall be performed when cold bending is initiated. A representative number of pipe diameters and schedules shall be sampled, and the findings documented on a Field Engineers Report format. The site ANI shall witness the verification of ASME III samples.

As an option, min. wall thickness can be Ultrasonic Tested and the measurements recorded on the "as built" drawings. Ultrasonic thickness measurements shall be made at the same locations outlined in 3.6.2 of Exhibit H.

- 7.14.4 See Exhibit E for Qualification and Verification Instructions.

- △ 7.15 Upon completion of the installation of piping components, the Piping Superintendent shall forward the Type IIB cards and/or quantity completion sheet to the QTS clerk.

- △ 7.16 The QTS clerk upon receipt of the Type IIB cards and/or quantity completion sheet shall:

7.16.1 Credit installed quantities for Quality Tracking purposes.

7.16.2 Forward the Type IIB cards to the RFE for inspection.

Note: If computer printed Type IIB cards are not available, the QTS clerk will provide handwritten Type IIB cards to the RFE.

- △ 7.17 The RFE, upon receipt of Type IIB Installation Cards, shall:

7.17.1 Verify that the installation of piping components is correct.

- △ 7.17.2 Verify the materials is per Specification(s) and drawing(s) and is traceable. If the material is not acceptable, refer to Appendix B of this procedure for additional information.

7.17.3 Verify that all components are free of damage.

- △ 7.17.4 Items of damage or incorrect installation shall be added to the system construction punchlist.

- △ 7.17.5 For "F" listed welds, the Piping Field Engineer must verify that the applicable QCIR has been signed off complete, prior to allowing the weld to be concealed, (i.e. an internal seal weld at the bottom of a water tank).

Small pipe components not installed for Start-Up reasons will be noted on the back of the Card and on the ISO. A copy of the Type IIB Card shall be initialed and dated by the RFE and given to QC as a notice of Field Engineering acceptance for ASME III, Q, and F-listed items (see note). Material is considered when

It is erected approximately in its final location and orientation, and one end welded or flanged connection complete. Pipe embedded in concrete may be considered complete for quality reporting only without completing a weld or flange connection.

Note: Speedy memos are also acceptable for notification of QC. When quality completion sheets are used in lieu of Type IIB cards.

The RFE shall inspect the valve or in-line component installation for general location and "internals" orientation to fluid flow prior to final closures (after which time internals will no longer be accessible for reference).

- A. Valves - Orientation to the fluid flow direction is usually shown on the valve if it is critical to the operation of the valve. In general, a valve with a globe configuration is to be installed with the pressure under seat. A stemmed valve is to be installed in the vertical position unless otherwise shown on the design drawings.
- B. Flow Elements - Orientation to the fluid flow direction will be shown on the Engineering approved data sheet sketch or manufacturer's drawing. The flow element is to be oriented so that the instrumentation pressure taps at the side of the elements are located per the reference drawings and are readily accessible. For flow elements that consist of a holed flat plate installed between flanges, see Para. C below.
- C. Restricting Orifices - Orientation to the fluid flow direction will be shown on the Engineering approved data sheet sketch for manufacturer's drawing. Holed flat plate restricting orifices installed between flanges are installed with the beveled edge of the hole facing downstream. They are provided with at least one "handle" which should protrude from the edge of the flanges when installed identifying the presence of the restricting orifice.
- D. Strainers - Orientation to the fluid flow direction will be shown on the Engineering approved data sheet sketch or Engineering approved manufacturer's drawing (or catalog). Large apex conical strainers (basket), box strainers, and wye strainers are installed with the fluid flow path into the strainer, and pointed apex conical strainers and tank outlet strainers are installed with the fluid flow path either into the strainer or against the outside of the strainer. Generally, when a fine mesh screen is specified for use in a strainer, it will be supported by a coarse mesh screen or perforated plate on its downstream side. Strainers that are inserted between the face of mating flanges will have at least one "handle" which is to protrude from the ends of the flanges when installed to identify the presence of a strainer. Wye strainers are to be installed with the screen chamber pointing down and in the same direction as the fluid flow. Screen retainer chamber covers are to be accessible for servicing.

- E. Rupture Discs - Orientation to the fluid flow direction will be shown on the Engineering approved data sheet sketch or Engineering approved manufacturer's drawing. The rupture disc is assembled dome side up between specially machined vendor flanges. If a vacuum support is specified, the support is fit to the concave (pressure) side of the disc and the two units assembled dome side up between the flanges. The rupture disc is supplied with a data tab which should protrude from the edge of the flanges when the disc is installed to show the presence of the rupture disc. When a mid flange is used (with two rupture discs), it is to be oriented so that the instrumentation pressure tap at the side of the flange is located per the reference drawings and is readily accessible.
- F. Expansion Joints - Orientation to fluid flow is generally immaterial. However, prior to installation of the expansion joint, the adjacent interconnecting piping and/or equipment is to be inspected to verify correct alignment and spacing. If either of these is unsatisfactory, the expansion joint may be improperly stressed when installed. Correction or minor misalignments by cold pulling is not allowed. Alignment and/or spacing adjustments must be made prior to expansion joint installations. Expansion joints that are supplied with bellows restraints are to have the restraints left intact until their removal is directed by engineering.
- G. Containment Penetration Flue Heads - Orientation to fluid flow is not a concern as the flue head can only be installed facing one direction. Once inserted in the penetration the process piping portion of the assembly is to be concentric with the penetration. Deviations from this concentricity are to be approved by Project Engineering. Review and verify the correct slope.
- H. Pipe Spools - Verify size, configuration and general location as shown on the drawings.
- I. Check the flanged connections to confirm that no unauthorized fitup adjustments are made. Check that faces are parallel; that bolt holes are accurately matched prior to bolt (stud) and gasket installation; that bolt (stud) threads and nut washer faces are lubricated with an approved lubricant when required, that the correct gasket(s) is (are) installed correctly (centered), and that the bolts (studs) and nuts have been assembled properly with the washer faces toward the flanges and the bolt (stud) threads completely engaging the nuts.

Check that the flange bolts (studs) are properly torqued or elongated to the specified final value in accordance with the method designated by engineering specification and/or procedure. This method involved tightening the bolts (studs), in a staggered sequence, using successive passes of increasing value. (For flange with 600 lb. pressure rating and higher). Torque paint is applied to nut and bolt stud interface after torquing is complete. (Non-Q only. QC will mark Q items).

Check the fabrication, installation, or rework to see that no unauthorized fitup adjustments are made by cold springing, hot bending, or cold bending of piping 2 1/2" and larger. When conditions make cold springing, hot bending, or cold bending necessary, the RFE shall issue a type II A Card in accordance with this procedure or work shall be performed in accordance with Exhibit "E" of this procedure.

17

Upon completion of inspection, the RFE shall return the Type IIB card to the QTS clerk to file.

- 7.18 If a Vendor supplied component must be disassembled, all work shall be done in accordance with the Vendor's supplied drawing(s) and/or instruction(s). Concurrence must be received from the RFE and RQCE (if ASME or "P" listed) prior to any work being performed. On B31.1 components or equipment, the RFE shall verify and document that the work is performed correctly.

The QCE shall witness and document that the work is performed correctly on ASME or "P" listed. An FCO will be prepared, by the RFE in accordance with SWP/P-112, if modification or alteration of the component is necessary. Exhibit "D" will be filled out by the RFE for each component disassembly/re-assembly.

- 7.19 The type II A Specific Work Plan/Procedure record as shown in Exhibit "D" will be assigned a number as follows:

SWP/P-3000-1-AB-1

				Sequence Number
				System Identification of major
				system
				Unit
				Specific Work Plan/Procedure
				Number

A log of records shall be maintained by the Lead Field Piping Engineer.

- 7.20 Upon completion of approximately eighty percent of the piping system (s), the RFE shall prepare a punch list in accordance with SWP/P-8 for completion of the system (s).
- 7.21 The punch list will be prepared using the latest revision of Design Drawing and Specifications.
- 7.22 When piping system (s) completion is accomplished the RFE shall prepare the system (s) for pressure leak testing in accordance with SWP/P-P-4. Testing facilitation (vents, drains, temporary connections, etc.) shall be incorporated on the system punch list per para. 7.19.
- 7.23 Type II A Specific Work Plan/Procedure records shall be provided, as determined by the Lead Field Piping Engineer, for miscellaneous piping activities.

Each record shall be assigned numbers as follows:

SWP/P-5000-AB- 1

				Sequence Number
				System Identification of major
				system
				Specific Work Plan/Procedure
				Number

A log of records shall be maintained by the Lead Field Piping Engineer.

7.24 If work is performed on items which are in storage and maintenance condition, the RFE must notify the maintenance group when work is complete. Upon notification, the maintenance group will assure that storage and maintenance are re-established.

7.25 The Piping Superintendent shall:

Be directly responsible for the installation of piping components.

Ensure the material traceability is maintained in accordance with applicable codes.

Monitor the installation activities to ensure quality workmanship is being performed and that engineering requirements are being met. Note: Non-conformances noted during installation shall be identified and controlled in accordance with the Construction Quality Control Manual.

Assure that care is taken to prevent damage to in-line components during handling, i.e., use of skids, nylon slings etc. Assure that all access openings are covered with approved material when work is not actually in progress.

Verify that piping cleanliness is in accordance with tech. spec. 10855-G-099Q. Notify Q.C. for internal cleanliness prior to installation of ASME III and "Q" items. The signing of Type IIB pipe spool installation card signifies that the piping superintendent or designee has verified cleanliness. When a pipe spool connects to equipment, (pump, tank, etc.) the equipment cleanliness is verified also. It is also acceptable for the piping superintendent to verify cleanliness by signing a quantity completion sheet. If this is done, a QTS clerk may place the superintendent's initials and the clerk's initials on the QTS (Type II B) card in place of the superintendent signing the QTS card.



8.0

RECORDS



8.1 Field Engineering verification and documentation of installation is by the Type II Card(s) or quality completion sheets.

8.2 Inspection records, test reports, code data reports, and vendor drawings shall be retained in accordance with SWP/P-2.

THERMAL INTERFERENCE WALKDOWN

1.0 PURPOSE

To assure piping systems are walked down to review interferences that could occur during plant heat-up with various commodities and document resolution of the same.

2.0 SCOPE

Piping to be considered by this program is all piping having potentially significant thermal movements, i.e. greater than 200°F.

3.0 DEFINITIONS

- A. Rigid Adjacent Commodity: An item adjacent to the piping system being evaluated which is attached to the building structure or equipment and has no displacement associated with its function. Examples: Tray and supports, conduit (rigid) and its supports, duct and its supports etc.
- B. Adjacent Piping: Pipe or tubing adjacent to the piping system being evaluated. The adjacent piping may or may not have displacements associated with its operation but must be evaluated for same.
- C. Piping Surface: The metal surface for piping which will not be insulated. For insulated piping, the insulating surface whether installed or not. Where insulation is not yet installed, Field Engineering will determine required insulation thickness and add that to the required clearances.
- D. Maximum Service Temperature: Maximum service temperature as designated in the line index, P-501(Q).

4.0 CRITERIA

For piping systems whose maximum service temperature is greater than 200°F, the following criteria shall be used:

- 4.1 Attachment 1 lists system isometrics and calculation numbers for piping which undergoes displacements greater than 2 inches. Marked up isometric drawings showing actual displacements,

including attached small pipe where applicable, will be transmitted to Field Engineering under cover letter as they are completed. Field Engineering will use the listed displacements as indicated below:

- 4.1.1 The minimum clearance from piping surface (as defined in 3.0 C) to adjacent rigid commodity shall be the actual number listed on the isometric markup.
- 4.1.2 The minimum clearance from piping surface (as defined in 3.0 C) to adjacent piping surface shall be determined as follows:
 1. Determine category of adjacent piping, 4.1 (greater than 2 inches) or 4.2 (equal to or less than 2 inches).
 2. If the adjacent pipe is category 4.1, obtain the actual displacement from the appropriate marked up isometric.
 - a. If the sign of the displacement on the adjacent piping is opposite and away from that of the piping under evaluation and the clearance in the cold condition is 2" minimum, the installation is acceptable.
 - b. If the sign of the displacement of the adjacent pipe is the same as the sign of the pipe under evaluation, assume the adjacent pipe displacement is zero and evaluate in accordance with 4.1.1.
 - c. If the sign of the displacement of the adjacent pipe is opposite and toward the pipe under evaluation, the minimum clearance requirement is the sum of the two displacements.
 3. If the adjacent pipe is category 4.2, the required minimum clearance shall be that on the marked up isometric plus 2 inches.
- 4.2 For piping not listed in Attachment 1 and with maximum surface temperature greater than 200°F, the following criteria shall apply:
 - 4.2.1 The minimum clearance between piping surface (3.0 C) and adjacent rigid commodity shall be 2 inches.
 - 4.2.2 The minimum clearance between piping surface (3.0 C) and adjacent piping surface shall be 4 inches.

5.0 PROBLEM RESOLUTION

When a violation of this criteria occurs, it shall be documented on the problem resolution form (Attachment 2) and submitted to Plant Design - R.E. for resolution. Insulation notching outside the drywell need not be documented unless it will exceed the limitations imposed by specification M-161, Paragraph 4.1.2. All proposed notching within the drywell shall be submitted for project approval on the resolution form.

Field Engineering shall draw an isometric view of the violation area in the space provided on the form. The location of the violation shall be dimensioned to an elbow or other fitting so it may be easily located. A detail sketch of the clearances, both actual and required will be made in the space provided. A mutually acceptable resolution will be agreed upon and documented on the form. The original will be returned to Field Engineering with a copy retained by the resident group.

6.0 RESPONSIBILITIES

- A. Piping System Engineers - to be knowledgeable of the criteria of this procedure and review their systems during walkdowns for system turnover to assure thermal interferences are documented prior to system turnover by writing a Thermal Interference Resolution Form (TIRF) and forwarding same to the Thermal Interference Coordinator for resolution.
- B. Piping Facility Engineer - perform final thermal interference walkdown prior to facility turnover.
- C. Thermal Interference Coordinator - will act as liason between field and Resident Engineering for resolution of thermal interference problems. He shall maintain the log and forward all TIRF's to Resident Engineering. He shall also assure rework (if required) is re-issued to the field and completed.
- D. Resident Engineering - shall review TIRF's as required and issue their proposed fix on each.

7.0 PROCEDURE

- A. Thermal interference found during walkdown. TIRF initiated stating problem.
- B. TIRF forwarded to the Thermal Interference Coordinator (TIC).
- C. The TIC reviews for completeness and validity. If correct, he issues the TIRF a number.
- D. The TIC logs TIRF twice. One log to be sequential, the other for line class.

- E. The TIC forwards TIRF to the Responsible Resident Engineer for resolution.
- F. Responsible Resident Engineer dispositions TIRF and returns it to TIC.
- G. If no rework is required, the TIC closes TIRF; files original and sends a copy to the originator.
- H. If rework is required, the TIC forwards a copy of the disposition TIRF to the originator and to the discipline required to perform the work.
- I. Upon completion of the work, the Responsible Discipline Engineer monitoring the work signs off the TIRF as rework complete.
- J. If rework is performed by a discipline other than the originator's discipline, the originator or his designee inspects to assure the thermal interference has been resolved, he signs the TIRF off as closed.

Note: The TIC will log the TIRF during each action. He shall also maintain all originals for signoff and file completed TIRF's.

ATTACHMENT 1

EXCEPTIONS TO STANDARD 2" THERMAL INTERFERENCE CRITERIA

<u>ISOMETRIC NUMBER *</u>	<u>STRESS CALCULATION NUMBER</u>
0-P-FB-03	2001
0-P-GA-03	1616
0-P-GA-06	1611
1-P-AB-01	10
1-P-AB-02	10,19
1-P-AB-03	10,1915,1918
1-P-AB-04	10
1-P-AB-06	1950
1-P-AC-01	1011
1-P-AC-02	1045
1-P-AC-05	1044
1-P-AE-01	1921
1-P-AF-07	1017
1-P-BC-02	1782
1-P-BD-01	1921
1-P-BG-01	1921
1-P-BJ-01	1921
1-P-CA-C2	1916
1-P-CA-06	1919
1-P-CA-233	1919
-234	1919
-235	1919
-236	1919
-237	1919
-238	1919
1-P-FB-01	1771
1-P-FC-01	43
1-P-GA-02	1927
1-P-HA-04	1974
1-P-AF-08	1098
1-P-AF-10	1089
1-P-BC-05	913
1-P-BG-01	1724
1-P-EC-02	958
0-P-FB-01	1607
1-P-FB-07	1917
1-P-GA-01	1935
1-P-GA-02	1935
1-P-GA-05	1935
1-P-GH-01	963
1-P-GS-01	1706
1-P-KJ-02	2103,1573
1-P-KJ-04	2104,1574
1-P-KJ-06	2105,1575
1-P-KJ-08	2106,1576

JOB 10855

THERMAL INTERFERENCE
WALKDOWN
PROBLEM RESOLUTION FORM

To: _____
From: _____
Date: _____

Isometric No. _____ Rev. _____
Room Number _____
Start Up System _____

The below described violation of Thermal Interference clearance criteria exists on the above referenced isometric. Please provide a resolution/response by _____.
(Date)

SKETCH

Isometric Coordinates _____	Detail Sketch of Violation

Field Proposed Resolution:

Final Resolution:

R.E. Signature _____ Date _____

Rework Completed: _____ Date _____

Concurrence By: _____ Date _____
TIC

Rework Required ☐ Yes ☐ No

[illegible]

UPGRADING OF MATERIAL FOR USE IN ASME SYSTEMS

NOTE: The Quality program for ASME construction at Hope Creek provides for ASME material to be obtained from qualified ASME material suppliers. It also requires that identification and segregation of materials while in-process of fabrication/installation is provided to assure that the correct material is utilized in each ASME pipe class. However, errors may occur occasionally and the following procedure is provided to upgrade material to meet the requirements of the ASME Code on a case by case situation only. This is not intended to allow the use of material procured from unqualified supplies.

FORWARD

Material which does not satisfy all of the requirements for the installation may fall into one of the following categories:

- A. The material was purchased from an approved supplier of ASME materials for installation in an ASME system and is certified to meet the requirements of NCA-3800, but lacks sufficient NDE examination such as UT or RT, or tests such as impact testing for use in a more strugent design applicaion or higher pipe class than for which it was ordered.
- B. The material was purchased from a supplier qualified under the ANSI N45.2 program to supply that type of material, for a Q-listed, non ASME system, was furnished with a CMTR, was not welded by the supplier, has traceability, but lacks certification required for ASME material that it meets the requirements of NCA-3800. In addition, the supplier is regularly audited by Bechtel, and Bechtel has audited the supplier within 1 year of receipt of the item.
- C. The material was furnished with or without a CMTR from a supplier who was not approved to supply that type of material. If the material falls into this category, it may not be upgraded.
- D. If the material as described in categories A & B above is inadvertently installed in an ASME system that requires the additional NDE or impact tests on the material, the installation is nonconforming and an NCR must be initiated to report the deficiency. The information which follows for categories A & B may be used to develop a disposition for the NCR.

If the material as described in category C above is installed, an NCR must be initiated to report the deficiency. The information which follows for category A & B does not apply.

If the material as described in A & B above is in storage, it may be upgraded prior to installation without an NCR being issued.

CATEGORY A

ASME material which is lacking an NDE examination may have the examination performed by the Bechtel NDE Subcontractor, Branch Labs, or by an approved offsite NDE contractor, whichever is more practical.

1.0 Material Already Installed

Material which has already been installed may have examinations performed that are required by the ASME Code for the product form if the installed configuration will allow meaningful results. The Responsible Engineer is to forward a request to QC to have the NDE performed by the NDE Subcontractor. If the examination shows the material is acceptable, the Responsible Engineer is to obtain a copy of the completed NDE report and request the material control group to initiate a Certified Material Test Report (CMTR) for the item in question. The RFE will also obtain instructions from the material control group for adding a trace code to the heat number.

1.1 The material control group will obtain a copy of the vendor supplied CMTR and attach the NDE report to it. This in turn will be attached to a Bechtel prepared CMTR (see Attachment 1). The Bechtel CMTR will list the vendor supplied CMTR and NDE report as attachments and identify a new trace code as follows:

- a. The abbreviation for the type test provided, (UT, PT, MT, RT, etc.) will be added to the existing heat number or heat code. In addition to the abbreviation a unique identification number will be added to the heat number. The material must also have this heat identification added to it.
- b. The CMTR will be certified correct by the PFE or his designee.

2.0 Material In Jobsite Storage

ASME material in storage may be examined by the Bechtel's jobsite NDE Subcontractor, an off-site qualified NDE laboratory, or it may be returned to the original supplier for examination if the supplier is approved for having such tests performed. Bechtel will provide a CMTR attaching the original vendor supplied CMTR and NDE reports. The heat number will be amended (ref. to para. 1.1 a.) to uniquely identify the item to the CMTR.

Category B

Where ASTM material not certified to an NCA-3800 program was used in the installation of ASME items and the ASTM material was procured to the ANSI N45.2 program, it may be acceptable without further processing if it meets the requirements of para. NX-2610 and/or the requirements of N-242-1 or N-242-1 of the code. If para. NX-2610 is not satisfied, it may be examined and tested to determine if it meets the requirements for the ASME material required for the installation it was used. The following shall apply:

1. The item must not have been welded by the manufacturer or supplier. If welding was performed, the material must not be used.
2. The material must have traceability to a CMTR provided under the ANSI N45.2 program, and the CMTR certification was performed during melting, and of the heat analysis.
3. A review of the CMTR must be made with the requirements of the ASME material specification. Those ASME requirements which were not met must be performed by Bechtel or its approved subcontractor. (Note: Heat treatment will be a problem if required for material already installed).
4. A piece of the material used (not one from another piece of the same heat) is sent to an approved lab for a chemical analysis.
5. The necessary NDE examination as required by the ASME Code for the product form is performed.
6. A CMTR is prepared by Bechtel to incorporate the original vendor supplied CMTR and all tests performed by Bechtel. The CMTR must be certified correct by the PFE or his designee.

BECHTEL CONSTRUCTION, INC.
HANCOCKS BRIDGE, NJ
JOB 10855

CERTIFIED MILL TEST REPORT FOR

[illegible]

ADDITIONAL NOTES:

EX _____

EXHIBIT "A"

LARGE PIPE SPOOL CARD

```

***** (1) SPOOL
** SPOOL **
** INSTALLED ** (1) SYS ISC (1) S/U
***** (1) VENDOR DWG
(1) UNIT (1) FACILITY -
(1) PEID (1) QTS AREA (1) ELE
(1) SIZE (1) LENGTH (1) MAT/SCH
(1) CLASS (1) AREA DWG
(1) STORAGE LOC (1) WRR (1) REC DATE / /
(3) ENGR REVIEW (3) INS DATE / /
(3) ENGR CHECK (3) CHK DATE / /
(2) ENGR ACCEPT (2) ACC DATE / /
(3) REMARKS-
(4) CLEANLINESS:
  
```

Note (1) - Preprinted information on card.
Information, other than Spool No.,
is not required for initial acceptance.

Note (2) - Field Engineer's Initials and date
indicates initial acceptance based on Para.
7.16. NCR's, if applicable, are completed.
All FCO's, if applicable, are completed.

Note (3) - Items are not required on this project.

Note (4) - Superintendents Initials indicates clean-
liness acceptance, based on Para. 7.23.

EXHIBIT "B"


VALVE CARD

```

***** (1) VALVE
** VALVE ** (1) ASSOC SPL
** INSTALLED ** (1) SYS ISO (1) S/U
***** (1) FAB ISO
(1) UNIT 9 FACILITY
(1) PEID - (1) QTS AREA (1) ELE 054
(1) SIZE (1) TYPE
(1) CLASS (1) AREA DWG
(1) STORAGE LCC (1) MRR (1) RFC DATE
(3) SLPT REVIEW (3) DATE
(2) PIPING ENGR REVIEW (2) DATE
(3) CC ENGR REVIEW (3) DATE
(4) VALVE SERIAL NUMBER

```

- Note (1) - Preprinted information of card.
Information, other than Valve No.,
is not required for initial
acceptance.
- Note (2) - Field Engineer's Initials and date in-
dicates initial acceptance based on Para.
7.16. NCR's, if applicable, are completed.
- Note (3) - Information not required for this project.
- Note (4) - Valve Serial Number to be recorded for
ASME Valves only.

		WORK PLAN/ PROCEDURE RECORD		TITLE Component Disassembly Worklist			PAGE OF		
				SPECIFIC WP/P NO.	PROJECT NO.	UNLISTED ITEMS YES <input type="checkbox"/> NO <input type="checkbox"/>	AREA/LOCATION	STARTUP SYS. NO.	
PREPARED BY & DATE		WORK OPERATION						Rev.	DATE
OPER NO.								F.E & DATE	VERIFY/ HOLD POINT
01	Reason for component disassembly:								
02	Component Number:								
03	Serial Number:								
04	Is component installed?								
05	Location of component:								
06	P.O. & Item Number:								
07	Vendor Instruction Manual:								
08	FCO Number (if required):								
09	Special Precautions:								
10	QC Notified								
11	Damage noted:								
12	Work performed:								
13	Verify component clean:								
	(On valves, the seating surfaces are free of scratches)								
14	Verify seat guide in place if gate valve:								

**2" AND SMALLER PIPE BEND
QUALIFICATION AND VERIFICATION INSTRUCTION**

1.0 SCOPE

- 1.1 This instruction describes the methods of assuring that the cold bending process for 2" and under pipe meets the criteria of specifications 10855-P-202(Q) and P-203 and the applicable codes, ASME Section III and ANSI B31.1.

2.0 GENERAL

- 2.1 All pipe bending machines and bending shoes used on this project will be qualified to this instruction.
- 2.2 All bending shoes will be marked with a unique number or letter designation as described in para. 2.2.1 & 2.2.2 to assure that quality verified bending shoes are used at all times.

17

- 2.2.1 All bending shoes and bending blocks to be used for bending carbon steel pipe will be painted red on each end and marked (etched) on each end in the following manner:

Material Type Shoe Is To Be Used On	Shoe Size	Unique Set * Number	
CS-	.50-	1	
CS-	.75-	1	
CS-	1-	1	
CS-	1.25-	1	* This number will
CS-	1.5-	1	change for each set
CS-	2-	1	of bending shoes.

17

- 2.2.2 All bending shoes and bending blocks to be used for bending stainless steel pipe will be painted yellow on each end and marked (etched) on each end in the following manner:

Material Type Shoe Is To Be Used On	Shoe Size	Unique Set * Number	
SS-	.50-	1	
SS-	.75-	1	
SS-	1-	1	
SS-	1.25-	1	* This number will
SS-	1.50-	1	change for each set
SS-	2-	1	of bending shoes.

EXHIBIT E

SWP/P-54, Rev. 17

- 2.3 Cold bending 2" and under pipe shall not be performed at metal temperature less than 55°F.

3.0 QUALIFICATION AND VERIFICATION

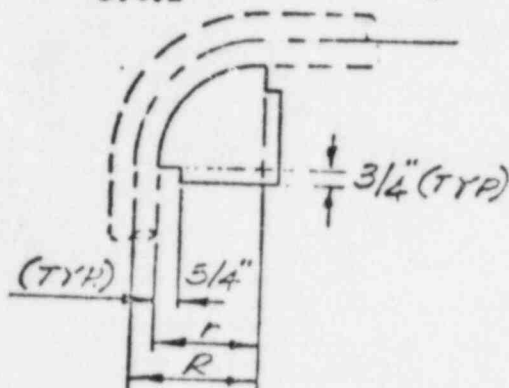
- 3.1 The minimum number of bend samples to be examined for each set of bending shoes shall be as follows:
- 3.1.1 Carbon Steel Pipe: twenty five bends of each size 1/2" thru 2" for schedule 80 and schedule 160.
 - 3.1.2 Stainless Steel Pipe: twenty five bends of each size 1/2" thru 2" for schedule 40S.
 - 3.1.3 This examination shall be performed and documented on in-process bending or sample bending at a rate of 100%. When the minimum number of qualification bends has been achieved an evaluation will be made to determine if this qualification has been successful. If the qualification is acceptable all subsequent bending will be monitored on a surveillance basis. If the qualification is unacceptable an additional 25 bends will be performed and evaluated, (see exceptions in paragraph 4.0).
- 3.2 The RFE shall measure each piece containing a bend with a micrometer and record the minimum outside diameter measured. (This measurement is the baseline value for quality testing. (DO)
- 3.3 The RFE shall check the operation of each bender for smoothness of operation and possible shoe slippage while bends are being produced.
- 3.3.1 Visually inspect bend for surface gouging or buckling.

EXHIBIT E

SWP/P-54, Rev. 17

3.4 The RFE shall examine the radius of each sample bend with a "GO - NO GO" template, for minimum 5° bend, which is fabricated as follows:

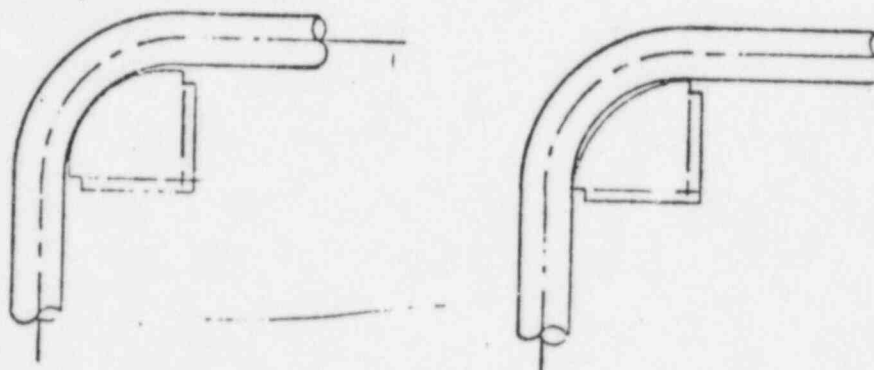
3.4.1



Where $R = 5$ (nom. pipe dia.)
 $r = R - 1/2$ pipe O.D.

2" dia.	$R = 10"$, $r = 8 \frac{3}{4}"$
1 1/2" dia.	$R = 7 \frac{1}{2}"$, $r = 6 \frac{1}{2}"$
1" dia.	$R = 5"$, $r = 4 \frac{1}{4}"$
3/4" dia.	$R = 3 \frac{3}{4}"$, $r = 3 \frac{1}{8}"$
1/2" dia.	$R = 2 \frac{1}{2}"$, $r = 2"$

3.4.2 Interpretation and acceptance criteria of 5° bend.



GO
 equal or greater
 than 5° bend

NO GO
 less than
 5° bend

3.5 The RFE shall measure the bend samples and calculate the ovality of each bend based on the following formula:

$$\text{OVALITY} = \frac{100 (D_{\max} - D_{\min})}{D_o} < 8\%$$

Where D_{\max} = The diameter of the pipe as measured along the axis perpendicular to the plane of the bend, after bending.

D_{\min} = The diameter of the pipe as measured along the axis normal to the bend, after bending.

D_o = Minimum O.D. of pipe as determined in para. 3.2

EXHIBIT E

SWP/P-54, Rev. 17

- 3.6 The RFE shall examine each bend to determine that bending did not infringe on minimum wall as shown in Appendix G of Spec. P-202(Q) for the size and schedule of the pipe bend examined by use of the following method:

- 3.6.1 Divide by marking the bend into four equal segments as shown in attachment "A".

Take ultrasonic thickness readings at each of the five segment marks at the heel of the bend. Log readings on permanent chart to be maintained in the field engineering files.

4.0 Exceptions

- 4.1 The following pipe classes are not to be bent when a fitting can be used in lieu of bending. If these pipe classes are bent, UT thickness measurement will be performed and documented as described in section 3.6 on all bends.

DEB 1/2" thru 1"	GSB 1/2" and 3/4"
EBB 1/2" thru 2"	GBC 1/2" and 3/4"
FBC 1/2" thru 1 1/2"	GBD 1/2" and 3/4"
FBD 1/2" thru 1 1/2"	GFD 1/2" and 3/4"

- 4.2 In addition 1" S/80 pipe with the heat number 255492 may not be used for bending on this project.

- 4.3 Small Pipe Field Engineering is to maintain a log of shoe and block set numbers.

System Isos Which Require p-205(Q) WPPR

Reactor Building

1-P-AB-06	1-P-BF-02	1-P-EC-08	1-P-EG-11
1-P-AN-03	1-P-BG-01	1-P-EC-09	1-P-EG-13
1-P-AP-01	1-P-BG-02	1-P-ED-01	1-P-EG-14
1-P-AP-02	1-P-BG-04	1-P-ED-03	1-P-EG-15
1-P-AP-05	1-P-BG-07	1-P-ED-04	1-P-EG-20
1-P-BC-01	1-P-BG-08	1-P-ED-06	1-P-FB-01
1-P-BC-03	1-P-BH-01	1-P-EE-01	1-P-FC-01
1-P-BC-04	1-P-BJ-01	1-P-EG-01	1-P-FD-01
1-P-BC-05	1-P-EA-02	1-P-EG-02	1-P-GH-01
			1-P-GB-01
			1-P-GB-18
1-P-BC-06	1-P-EA-03	1-P-EG-03	1-P-GJ-02
1-P-BD-01	1-P-EA-04	1-P-EG-04	1-P-GS-01
1-P-DE-01	1-P-EC-01	1-P-EG-05	1-P-GS-02
			1-P-HA-07
1-P-BE-02	1-P-EC-02	1-P-EG-06	1-P-HB-01
1-P-BF-01	1-P-EC-03	1-P-EG-07	1-P-KA-03
	1-P-EC-05		1-P-KB-01
	1-P-ED-06		1-P-KC-03
			1-P-KC-06
			1-P-KG-01
			1-P-KG-05

Auxillary Building

0-P-AN-01	0-P-HA-02	0-P-HC-02	1-P-GJ-10
0-P-AP-01	0-P-HA-07	0-P-HC-03	1-P-HA-02
0-P-AP-02	0-P-HA-08		
0-P-AP-03			
0-P-BF-01	0-P-HB-01	0-P-HC-05	1-P-JE-01
0-P-BG-01		0-P-HC-11	
0-P-BH-01			
0-P-BC-06	0-P-HB-02	0-P-KA-01	1-P-JE-02
0-P-ED-09			
0-P-EC-01			
0-P-FB-01	0-P-HB-04	1-P-ED-05	1-P-JE-03
0-P-GA-01	0-P-HB-05	1-P-EG-08	0-P-KC-01
0-P-GA-03	0-P-HB-06	1-P-EG-21	1-P-KC-05
0-P-GA-04	0-P-HB-07	1-P-EG-24	1-P-KJ-02
	0-P-HB-08	1-P-GB-21	
0-P-GA-05	0-P-HB-09	1-P-GJ-01	1-P-KJ-04
	0-P-HB-11	1-P-GJ-03	
0-P-GA-06	0-P-HB-12	1-P-GJ-04	
0-P-GA-07	0-P-HB-13	1-P-GJ-05	1-P-KJ-06
	0-P-HB-15		
0-P-GA-08	0-P-HB-16	1-P-GJ-06	
0-P-GA-09	0-P-HB-19	1-P-GJ-07	1-P-KJ-08
0-P-GA-10	0-P-HB-23	1-P-GJ-08	0-P-KH-01
0-P-GA-11	0-P-HB-24	1-P-GJ-09	
0-P-GA-12	0-P-HC-01		

EXHIBIT F

SWP/P-54 Rev. 17

System Isos Which Require P-205(Q) WPPR

Turbine Building

1-P-AB-01	1-P-AD-08	1-P-AF-14	1-P-CG-03
1-P-AB-02	1-P-AD-10	1-P-AF-15	1-P-CJ-01
1-P-AB-03	1-P-AE-01	1-P-AN-01	
1-P-AB-04	1-P-AE-02	1-P-AN-04	
1-P-AB-06	1-P-AE-03	1-P-AP-04	
1-P-AC-01	1-P-AF-01	1-P-AP-07	
1-P-AC-02	1-P-AF-02	1-P-BB-02	1-P-DA-01
1-P-AC-03	1-P-AF-03	1-P-CA-01	
1-P-AC-04	1-P-AF-05	1-P-CA-02	1-P-FB-02
1-P-AC-05	1-P-AF-07	1-P-CA-03	1-P-FB-07
1-P-AD-01	1-P-AF-08	1-P-CA-04	1-P-FW-01
1-P-AD-02	1-P-AF-09	1-P-CA-05	1-P-FW-02
1-P-AD-03	1-P-AF-10	1-P-CA-06	1-P-GA-01
		1-P-CA-07	1-P-GA-02
		1-P-CA-08	1-P-GA-04
		1-P-CF-01	1-P-GA-05
			1-P-GA-06
			1-P-GA-07
			1-P-GA-08
1-P-AD-04	1-P-AF-11	1-P-CF-02	1-P-GB-10
1-P-AD-05	1-P-AF-12	1-P-CG-01	1-P-HA-04
1-P-AD-06	1-P-AF-13	1-P-CG-02	1-P-HB-02
			1-P-KA-01
			1-P-KB-02
			1-P-LG-01

Drywell

1-P-AB-01	1-P-BC-02	
1-P-AB-07	1-P-BE-03	
1-P-AB-08	1-P-BG-03	
1-P-AB-09	1-P-FC-01	
1-P-AB-10	1-P-FD-01	
1-P-AB-11	1-P-GB-02	
1-P-AE-01	1-P-CB-07	
1-P-AE-04	1-P-CB-01	[1-P-GB-12, 1-P-GB-14] - Inside Drywell

Yard

0-P-AM-01	1-P-AP-03	1-P-EQ-01
0-P-EA-01	1-P-DA-04	1-P-HC-01
0-P-FB-03	1-P-EA-05	1-P-JA-04
0-P-JA-03	1-P-EA-06	

EXHIBIT "G"

FLANGE CARD

***** FLANGE NO	
03 FLANGE	04 ASSOC SPEC
08 RECORD	09 SYS ISO E
***** FAB ISO	
(1) UNIT	(1) FACILITY G
(1) AREA DWG	(1) QTS AREA
(1) SIZE	(1) CLASS
TORQ REQ	RT HT PT LT UT PHT VT
(3) NDE REQ	(1) ELEV
(3) NDE COMPLT	(1) SCHD
(3) TYPE WELD	
(3) WELDERS	
(3) WELD COMPLT	(3) SUPT
(2) VERIFIED	(3) FWE
(3) COMPUTER CKD	FWE
	(3) DATE
	(2) DATE
	DATE

BFP 22149

Note (1) - Preprinted information on card. Information, other than Flange No., is not required for initial acceptance of item.

Note (2) - Field Engineer's Initials and date indicates initial acceptance based on Para. 7.16. All NCR's, if applicable, are complete.

Note (3) - Items are not required on this project.

ASSOCIATED ITEMS CARD

```

*****ASSOC. ITM.
** ASSOC ITM ** (1) ASSOC SPL
** INSTALLED ** (1) SYS ISO (1) SAU
***** (1) FAB ISO
(1) UNIT (1) FACILITY
(1) PID (1) TS AREA (1) ELE
(1) SIZE (1) TYPE
(1) CLASS (1) AREA DWG
(1) STORAGE LOC (1) MBR (1) REC DATE
(3) SPT REVIEW (3) DATE
(2) PIPING ENGR REVIEW (2) DATE
(3) QC ENGR REVIEW (3) DATE
(3) SERIAL NUMBER

```

BFP 22148

- Note (1) - Preprinted information on Card. Information, other than Assoc. Item No., is not required for initial acceptance.
- Note (2) - Field Engineer's Initials and date indicates initial acceptance based on Para. 7.16. All NCR's, if applicable, are complete.
- Note (3) - Items are not required on this project.

SMALL PIPE CARD

***** ID - - - - -
 * LINE IDENT. *
 * INSTALLED #/S/U SYS - - - - -
 ***** COMP DWS SP - - - - -

(1) BLDG - - - - -
 (1) (1) (1) (1) (1) (1)
 CLS U P OT SLV SIZE LGTH PID SH SP-ISC

(3) Supt REVIEW INST. DATE / /
 (3) ENGR CHECK (3) CHECK DATE / /
 (2) ENGR ACPT (2) CHECK DATE / /
 (3) ENGR AC-
 SEP 22 1969

- Note (1) - Preprinted Material on Card.
 Information, other than ID No.,
 is not required for initial acceptance.
- Note (2) - Field Engineer's initials and date in-
 dicates initial acceptance of all items
 within that identity in accordance with
 Para. 7.16. All drawing changes for
 this identity, if applicable, are complete.
 All NCR's, if applicable, are complete.
- Note (3) - Items are not required on this project.
- Note (4) - Superintendents Initials indicates clean-
 liness acceptance, based on Para. 7.23.

Diagram of a 90-degree elbow with five points (1-5) and a 22 1/2 degree angle. The diagram shows a quarter-circle arc with points 1, 2, 3, 4, and 5 marked along it. Point 1 is at the start of the arc, and point 5 is at the end. A vertical line from point 5 to the horizontal centerline is labeled "5 TAN PT.". A horizontal line from point 1 to the vertical centerline is labeled "1 TAN PT.". The angle between the centerline and the line to point 5 is labeled "22 1/2° (TYP.)".

[illegible]

JUN -3 '85 0283494

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 1 of 2

RESOLUTION/COMPLETION REPORT

OR No. 29 Rev. 1 Date 5/31/85
R/CR No. 29 Rev. 0 Date 6/3/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

LCOesterick for Rust
Discipline Group Supervisor

6/3/85
Date

[Signature]
Bechtel Project Engineer

6/3/85
Date

4. Public Service Electric and Gas Company review:

[Signature]
Chief Project Engineer

6/3/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 29 Rev. 1 Date 5/31/85
R/CR No. 29 Rev. 0 Date 6/3/85

Following is our response to the recommendation for resolution:

- 4a. As indicated in the response to ORs 27 and 28, Design Specification 10855-M-068 is in the process of being revised and will reflect the project licensing commitments as currently shown in the FSAR. This specification will be reissued by June 14, 1985.

The ASME Code does not require stress reports for Class 2 and 3 piping. Therefore, stress reports will not be reviewed against M-068.

- 4b, c, and d. As indicated in the response to ORs 27 and 28, in general, design specifications are prepared as a basis for the initial design and are revised periodically to reflect changes in the design requirements as the design process continues. While certain inconsistencies between the specifications and the actual design may exist from one revision to the next, the actual design will reflect the current requirements which are implemented as a result of FSAR commitments, field changes, etc., and referenced in the calculations. Prior to completing the final design, any differences between the design specification and the actual as-built design will be reconciled.

Engineering Department Procedure (EDP) 4.50 and its associated EDPI 4.50.1 generally describe the controls for updating Design Specifications.

MAY 30 '85 1283364

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 1 of 2

RESOLUTION/COMPLETION REPORT

OR No. 30 Rev. 0 Date 5/21/85
R/CR No. 30 Rev. 0 Date 5/30/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

CSB LC Osterwick for P&G
Discipline Group Supervisor

5-29-85
Date

[Signature]
Bechtel Project Engineer

5/30/85
Date

4. Public Service Electric and Gas Company review:

[Signature]
Chief Project Engineer

5/30/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. <u>30</u>	Rev. <u>0</u>	Date <u>5/21/85</u>
R/CR No. <u>30</u>	Rev. <u>0</u>	Date <u>5/30/85</u>

The concrete temperature is limited by insulation on the process pipe and by the thermal resistance of three air gaps in the triple flued head penetrations (see Dwg. P-3002-1, Rev.13). Based on engineering judgement, past experience, and expected heat removal by natural convection in the three air gaps, it was not considered necessary to calculate the concrete temperature. As noted in FSAR Section 14.2. 12.3.37, PSE&G has committed to testing during power ascension to verify that the allowable concrete temperature is not exceeded.

To substantiate our earlier judgement, an analysis has been performed to determine concrete temperatures at penetrations P1A, P2A and P12, including the effects of proximity to each other. (See drawings C-0928-0, Rev.10 and C-0929-0, Rev.16.) The highest concrete temperature was found to be less than 200°F. This analysis will be transmitted to Sargent and Lundy by May 31, 1985.

RESOLUTION/COMPLETION REPORT

OR No. 31 Rev. 0 Date 5/21/85
R/CR No. 31 Rev. 0 Date 5/29/85

1. Classification of Observation (by S&L):

_____	Not significant to safety
_____	Significant to safety
<u> X </u>	Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

W. J. L. Gamm/BCE
Discipline Group Supervisor

May 29, 1985
Date

Bechtel Project Engineer

5/25/85

Date

4. Public Service Electric and Gas Company review:

William J. Bailey
Chief Project Engineer

Date 5/30/15

5. S&L's disposition of Resolution/Completion Report:

_____ Observation invalid and withdrawn.
 _____ Proposed resolution/future action acceptable,
 observation closed.
 _____ Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

Not significant to safety
Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
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RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 31 Rev. 0 Date 5/21/85
P/CR No. 31 Rev. 0 Date 5/29/85

- 4a. EDP-4.36 and EDP-4.37 define the requirements for Bechtel Engineering's use of computer programs and do not apply to vendors or sub-vendors.

Computer verification documentation is on file with the company using the program.

- 4b Assurance of satisfactory performance by Anumet in accordance with an and approved QA program is the responsibility of Anchor/Darling. Anchor/
c Darling's QA manual (10855-P-3014302Q-3-16), paragraph 9.4.22, "Acceptance of Services", covers Anchor/Darling's program for service type subvendors.

Similarly, Bechtel is responsible for assuring Anchor/Darling's compliance with an approved QA program as evidenced by Bechtel's approval of the above listed Anchor/Darling QA manual. Additionally, Bechtel periodically audits Anchor/Darling to verify their compliance with their QA program.

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
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RESOLUTION/COMPLETION REPORT

OR No. 32 Rev. 0 Date 5/23/85
R/CR No. 32 Rev. 0 Date 6/3/85

1. Classification of Observation (by S&L):
☐ Not significant to safety
☐ Significant to safety
☒ Additional Information required
2. Reviewee proposed resolution:
 See Sheet 2.
3. Reviewee resolution report by:

CLP H. H. Hest for SB
Discipline Group Supervisor

[Signature]
Bechtel Project Engineer

5/31/85
Date

6/3/85
Date
4. Public Service Electric and Gas Company review:

William Bailey
Chief Project Engineer

6/3/85
Date
5. S&L's disposition of Resolution/Completion Report:
☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable, observation closed.
☐ Additional action to be taken by Reviewee (provide additional information).
6. Final classification of observation by Review Committee:
☐ Not significant to safety
☐ Significant to safety
7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 32 Rev. 0 Date 5/23/85
R/CR No. 32 Rev. 0 Date 6/3/85

- a) A confirmatory sampling and testing was performed to develop the design yield strength for the conduit materials. As calculation 677-156(Q), Rev.0 indicates, twenty test specimens were randomly selected and tested. The lowest test value ($F_y = 29.5 \text{ ksi}$) is conservatively selected for design. This design yield strength is determined to be adequate since it compares reasonably with the lower bound yield strength of mild steel, and based on the additional conservatisms outlined below in Item b). Accordingly, it was felt that the number of samples tested was adequate to support the design basis with the provisions and conservatisms that are defined herein.
- b) The yield strength of 2" diameter conduits will not be significantly different from the yield strength of 3/4", 1" or 1-1/2" diameter conduit since the manufacturing processes are essentially the same. Therefore, 2" diameter conduits were not tested.

In addition, as discussed in calculation 677-156(Q), the following conservatisms are inherent in the span calculations:

- o Simple span moment was assumed versus a typical actual condition of continuous span. This provides a design margin of about 25%.
- o The coupler was assumed at the point of maximum moment and the section modulus was conservatively based on the section at the root of the threads. This provides a margin of 82% for 2" conduits. (For 3/4" to 1-1/2" conduits, the margin varies from 91% to 111%.)
- o An additional 10% safety margin beyond FSAR and Code requirements is used.

The above conservatisms provide substantial design margin in the span calculations and confirm that the FSAR seismic requirements are met.

- c) The allowable span lengths of conduits are, in general, reduced by 10% to account for yield strengths lower than the design value. In the reassessment program, it is determined that this margin is not required for 3/4" and 1" diameter conduits located at the upper elevations in the Reactor, D/G and Control Buildings because additional design margins, as discussed in section b) of this R/CR, are already inherent in the design.

Based on the above, it is determined that the FSAR seismic requirements are met.

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 1 of 3

RESOLUTION/COMPLETION REPORT

OR No. 33 Rev. 0 Date 5/23/85
R/CR No. 33 Rev. 0 Date 6/3/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

Phillip Schuetz
Discipline Group Supervisor

Date 6/3/85

KB/MDP
Bechtel Project Engineer

Date 6/3/85

4. Public Service Electric and Gas Company review:

William J. [Signature]
Chief Project Engineer

Date 6/9/85

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

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RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 33 Rev. 0 Date 5/23/85
R/CR No. 33 Rev. 0 Date 6/3/85

Response to Description of Observation:

- a. For the specific situation described in the OR, it was determined that adequate testing had been performed for qualification based on the following:
- o During OBE Z-axis testing, the bolt became loose and prevented the valve from opening fully after the component had been vibration-aged for 180 minutes along each axis, undergone two OBE test sequences at 3.3 g in the Y-axis, and one OBE test sequence at 3.3 g in the X-axis. Both the vibration aging and the Y-axis OBE tests were twice the amount required.
 - o The OBE testing level of 3.3 g is well in excess of the actual accelerations, which are generally in the range of 0.75 to 1.6 g with a single condition of 2.06 g.
 - o The bolt that became loose was reinstalled and retained by positive methods (set screws) to prevent future loosening.
 - o After the reinstallation of the bolt and addition of the set screws a functional test was performed on the valve to verify operation and satisfy the OBE testing in the Z-axis with the valve open.

Based on Bechtel's review of the entire vibration testing program, it was determined that the bolt would not become loose if the testing had been limited to the specification requirements. The addition of the 2 set screws provided further assurance against any loosening without adversely affecting the qualification program in any way.

- b. Objective evidence that the actuators supplied to Hope Creek were modified is provided in Supplier Quality Surveillance Report 10855-P-305(Q)-AC (Sub D) Nos. 3 and 8 (submitted separately).

Response to Recommendation for Resolution:

- a. The response provided above in the first portion of this report is justification for taking credit for previously performed testing.
- b. Assurance that the supplied valves were modified to reflect the tested condition is provided in Supplier Quality Surveillance Reports identified above.
- c. For the situation cited in this OR, the modifications identified were incorporated into the components shipped to Hope Creek. This is documented by Supplier Quality Surveillance Reports identified above.

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OR No. <u>33</u>	Rev. <u>0</u>	Date <u>5/23/85</u>
R/CR No. <u>33</u>	Rev. <u>0</u>	Date <u>6/1/85</u>

- d. For the situation cited in this OR, adequate justification is provided to support the use of qualification testing performed prior to component failure.

RESOLUTION/COMPLETION REPORT

OR No. 34 Rev. 0 Date 5/23/85
R/CR No. 34 Rev. 0 Date 6/3/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

CB LC Oestrich for Rutt
SA Discipline Group Supervisor

6-3-85
Date

[Signature]
Bechtel Project Engineer

6/3/85
Date

4. Public Service Electric and Gas Company review:

[Signature]
Chief Project Engineer

6/3/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

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RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 34 Rev. 0 Date 5/23/85
R/CR No. 34 Rev. 0 Date 6/3/85

Following is our response to the recommendation for resolution:

4.a The actual Code effective date for Class 1 Non-NSSS piping analysis is the 1977 edition, through Summer 1979 Addenda. FSAR change notice No.841 was issued on March 7, 1985, in which the exceptions listed in footnote 1 were deleted and the Code date specified was changed to Section III, 1977 edition through Summer 1979 Addenda. Specification 10855-M95(Q), Rev.5, was issued May 7, 1985, incorporating this change into Appendix A, Table 1. Design Specification 10855-M-067(Q) is presently under revision and will be consistent with FSAR Table 3.9-9 and Specification 10855-M095(Q), Rev.5. Design Specification 10855-M-067 will be revised by June 14, 1985.

4.b This observation reflects design evolution on the Hope Creek project. The request for Code effective date revision was formalized with the referenced FSAR change notice in March. Specification M-095 was revised to conform to the FSAR change notice in May. Specification M-067 will be similarly revised in June.

It should be noted that, in general, design specifications are prepared as a basis for the initial design and are revised periodically to reflect changes in the design requirements as the design process continues. While certain inconsistencies between the specification and the actual design may exist from one revision to the next, the actual design will reflect the current requirements which are implemented as a result of FSAR commitments, field changes, etc. Prior to completing the final design, any differences between the design specification and the actual as-built design will be reconciled.

4.c Engineering Department Procedures (EDP) 4.22 and 4.23 and the corresponding Instructions, EDPI 4.22.1 and 4.23.1, generally describe the controls for updating the FSAR.

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RESOLUTION/COMPLETION REPORT

OR No. 35 Rev. 0 Date 5/23/85
R/CR No. 35 Rev. 0 Date 6/3/85

1. Classification of Observation (by S&L):

- ☐ Not significant to safety
☐ Significant to safety
☒ Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

Joseph Z. [illegible]
Discipline Group Supervisor

5/31/85
Date

[Signature]
Bechtel Project Engineer

6/3/85
Date

4. Public Service Electric and Gas Company review:

William [illegible]
Chief Project Engineer

6/3/85
Date

5. S&L's disposition of Resolution/Completion Report:

- ☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable, observation closed.
☐ Additional action to be taken by Reviewee (provide additional information).

6. Final classification of observation by Review Committee:

- ☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

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RESOLUTION/COMPLETION REPORT
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OR No. 35 Rev. 0 Date 5/23/85
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BPC Response to S&L Description of Observation, Item 2a and Example 1
Design Specifications 10855-M-068(Q), Rev.1, and M-067(Q), Rev.2, are used to define code boundaries for instrument and process piping. These specifications do not apply to instrument tubing.

Technical Specification for Control Systems Instrument Installation Procedures, 10855-J-825(Q), Rev.6, Section 7.1.f., references 10855-J-G1010-3, Rev.4, as the document to be used for instrument tubing classifications. This specification, in conjunction with the instrument installation details, are the documents used by the field engineering organization to produce tubing isometrics used to construct the ASME tubing installations.

BPC Response to S&L Description of Observation, Item 2b and Example 2
P&ID legend M-00-0, Sheet 2, Rev.7, Note 13, states that "Unless otherwise noted, all pressure, flow and level sensing primary element connections are assumed to have root valves. Instrument installation details will show specific requirements." The instrument installation details show that the piping class is to be used through the root valve and that the tubing class is to be used after the root valve. The second sentence of Note 17, which refers to drawing J-G1010, not only applies to excess flow check valves but to all tubing installations. Therefore, Notes 13 and 17 together provide the appropriate references to be used by the designers of ASME tubing installations.

BPC Response to S&L Recommendation for Resolution, Item a
Code classification and code boundaries for instrument piping are determined and documented per the requirements of Design Specifications M-067(Q) and M-068(Q). Code classification and code boundaries for instrument tubing are determined and documented per the requirements of Technical Specification J-825(Q) and drawing J-G1010-3. No corrections to documents and drawings referenced in this OR are required.

BPC Response to S&L Recommendation for Resolution, Item b
Based on BPC responses to items 2a, example 1, 2b and example 2, there is no failure in the design process and no corrections are required.

BPC Response to S&L Recommendation for Resolution, Item c
Based on the BPC responses to item 2a, example 1, 2b and example 2, assurance exists that the design, fabrication, installation, examination and testing of all ASME instrument piping and tubing have been done in accordance with the ASME code.

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RESOLUTION/COMPLETION REPORT

OR No. 36 Rev. 0 Date 5/23/85
R/CR No. 36 Rev. 0 Date 6/3/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

Bechtel is currently developing a resolution to the subject OR.
A complete Resolution/Completion Report will be furnished by
June 21, 1985.

3. Reviewee resolution report by:

Phillip Schuch / SB
Discipline Group Supervisor

6/3/85
Date

[Signature]
Bechtel Project Engineer

6/3/85
Date

4. Public Service Electric and Gas Company review:

[Signature]
Chief Project Engineer

6/3/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

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Hope Creek Generating Station - Unit 1

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RESOLUTION/COMPLETION REPORT

OR No. 37 Rev. 0 Date 5/23/85
R/CR No. 37 Rev. 0 Date 6/3/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

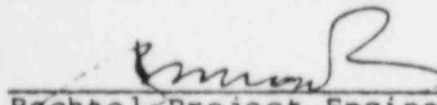
2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

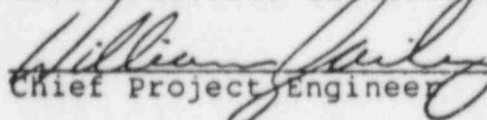
to SCO letter: 2 for Trust
Discipline Group Supervisor

6-3-85
Date


Bechtel Project Engineer

6/3/85
Date

4. Public Service Electric and Gas Company review:


Chief Project Engineer

6/3/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

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Hope Creek Generating Station - Unit 1

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RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 37 Rev. 0 Date 5/23/85
R/CR No. 37 Rev. 0 Date 6/3/85

The following is our response to the observation and recommendation for resolution:

The a-c powered ECCS jockey pumps, of which the HPCI jockey pump (1-AP-228) is one, are part of the ECCS Discharge Line Fill Network described in FSAR Section 6.3.2.2.6. As stated in that section, the fill system "is not considered an integral part of the ECCS". The HPCI jockey pump is not necessary for the startup of the HPCI system. Therefore, there is no contradiction with the quoted statement from Section 6.3.2.2.1 regarding independence of the HPCI system from a-c power.

Although not part of the ECCS, the discharge line fill network, including the HPCI jockey pump, is considered safety-related and designed to Seismic Category I criteria. The pumps are powered from separate class 1E busses and are automatically sequenced onto their respective standby diesel generators in the event offsite power is lost. ECCS jockey pump discharge line pressure is displayed in the control room and low pressure is alarmed.

The above design features, combined with the surveillance required by the Technical Specifications (refer to HCGS Draft Technical Specifications, Section 4 5.1.a.1.a, copy attached), provide adequate assurance that the ECCS, including HPCI, will function when required.

EMERGENCY CORE COOLING SYSTEMSSURVEILLANCE REQUIREMENTS

4.5.1 The emergency core cooling systems shall be demonstrated OPERABLE by:

- a. At least once per ^{core spray system} 31 days:
 1. For the ~~ECS~~^{core spray system}, the LPCI system, and the HPCI system:
 - a) Verifying by venting at the high point vents that the system piping from the pump discharge valve to the system isolation valve is filled with water.
 - b) Verifying that each valve, manual, power operated or automatic, in the flow path that is not locked, sealed, or otherwise secured in position, is in its correct* position.
 - ~~2. For the LPCI system, verifying that (the) (at least one) LPCI system subsystem cross-tie valve is (open) (closed with power removed from the valve operator).~~
 - 2.1 For the HPCI system, verifying that the HPCI pump flow controller is in the correct position.
- b. Verifying that, ^{core spray system} (when tested pursuant to Specification 4.0.5:
 1. The two ~~ECS~~ pumps in each subsystem together develop a flow of at least ~~16350~~ gpm against a test line pressure of greater than or equal to ~~3~~ psig, corresponding to a reactor vessel pressure of ~~> (115) psig~~.
 2. ~~The two~~ ^{Each} LPCI pumps in each subsystem ~~together~~ develops a flow of at least ~~(21,000)~~ gpm against a test line pressure of ~~> 4~~ psig, ^{10,000} corresponding to a reactor vessel to primary containment differential pressure of ~~> (20) psig~~.
 3. The HPCI pump develops a flow of at least ~~5000~~ ⁵⁶⁰⁰ gpm against a test line pressure of ~~> 2~~ psig when steam is being supplied to the turbine at ~~1000, 140, 200~~ psig.**
- c. At least once ^{core spray system} per 18 months:
 1. For the ~~ECS~~, the LPCI system, and the HPCI system, performing a system functional test which includes simulated automatic actuation of the system throughout its emergency operating sequence and verifying that each automatic valve in the flow path actuates to its correct position. Actual injection of coolant into the reactor vessel may be excluded from this test.

*Except that an automatic valve capable of automatic return to its ECCS position when an ECCS signal is present may be in position for another mode of operation.

**The provisions of Specification 4.0.4 are not applicable provided the surveillance is performed within 12 hours after reactor steam pressure is adequate to perform the test.

Value to be determined during pre-op testing.

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RESOLUTION, COMPLETION REPORT

OR No. 38

Rev. 0

Date 5/28/85

R/CR No. 38

Rev. 0

Date 6/4/85

1. Classification of Observation (by S&L):

- ☒ Not significant to safety
☐ Significant to safety
☐ Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

PCB LC Osterich for Pult
Discipline Group Supervisor

6/4/85
Date

KB/JP
Bechtel Project Engineer

6/4/85
Date

4. Public Service Electric and Gas Company review:

SPS W. G. ...
Chief Project Engineer

6/4/85
Date

5. S&L's disposition of Resolution/Completion Report:

- ☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable, observation closed.
☐ Additional action to be taken by Reviewee (provide additional information).

6. Final classification of observation by Review Committee:

- ☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

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Hope Creek Generating Station - Unit 1

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RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 38 Rev. 0 Date 5/28/85
R/CR No. 38 Rev. 0 Date 6/4/85

Following is our response to the recommendation for resolution:

- 4.a Design Specification 10855-M-067(Q) will be revised to clarify that the ASME Code, Section III, is not applicable to non-in-line instruments. This revision will be issued by June 14, 1985.
- 4.b There are no regulations or codes that require non-in-line instruments to have ASME III classification. The primary governing design document for classification of non-in-line instrumentation is Bechtel Design Guide J.2.8.2.4, which does not require ASME III classification; therefore, the information in 10855-M067(Q) has not been implemented in the instrumentation design.
- 4.c There is no failure in the design process since the design of non-in-line instrumentation is performed in accordance with the governing design document and not 10855-M-067(Q).

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RESOLUTION/COMPLETION REPORTOR No. 41Rev. 0Date 5/28/85R/CR No. 41Rev. 0Date 6/4/85

1. Classification of Observation (by S&L):

- Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

H. Kenneth Coole

Discipline Group Supervisor

6/4/85

Date

M. R. Hentschel/KWB

Bechtel Project Engineer

6/4/85

Date

4. Public Service Electric and Gas Company review:

James W. Toole
 Chief Project Engineer

6/4/85
 Date

5. S&L's disposition of Resolution/Completion Report:

- Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

- Not significant to safety
 Significant to safety

7. Review Committee signatures:

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Hope Creek Generating Station - Unit 1

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(Continuation sheet)

OR No. 41 Rev. 0 Date 5/28/85
R/CR No. 41 Rev. 0 Date 6/4/85

- 4.a We have determined that the FSAR statement and our battery charger sizing calculations are consistent with each other with regard to battery charger sizing criterion. FSAR Section 8.3.2.1 2.3 states the battery chargers are capable of restoring the battery from design minimum charge state to the fully-charged state within 12 hours. We consider the term "design minimum charge state" to mean the state of the battery after it has been discharged per the required design load duty cycle or profile. This is higher than the the manufacturer's minimum cell voltage of 1.75. Our interpretation, we believe, is consistent with IEEE Standard 308-1974 and NRC's standard technical specification requirements that the battery shall be maintained in a fully-charged state and that performance tests on the battery be periodically conducted using the design duty cycle. Thus, the battery charger must maintain the battery in a fullycharged condition after the battery has experienced a discharge because of performance testing or of assumed plant shutdown without battery charger support. In either case, the worst case load for the battery is represented by the design load duty cycle or profile.
- 4.b There is no revision required to satisfy FSAR commitment on battery charger capability presently stated in FSAR Section 8.3.2.1.2.3 because design calculations 4.1(Q) and 5.1(Q) used the ampere hours representing the design load duty cycle as one of the factors for sizing.
- 4.c This observation is considered as not significant to safety.

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RESOLUTION/COMPLETION REPORT

OR No. 42 Rev. 0 Date 5/28/85
R/CR No. 42 Rev. 0 Date 6/5/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

S. Srivastava
Discipline Group Supervisor

6/5/85
Date

J. M. [Signature]
Bechtel Project Engineer

6/5/85
Date

4. Public Service Electric and Gas Company review:

HCP
W. [Signature]
Chief Project Engineer

6/5/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

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Hope Creek Generating Station - Unit 1

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RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 42 Rev. 0 Date 5/28/85
R/CR No. 42 Rev. 0 Date 6/5/85

Response to Description of Observation

Calculations for conduit support connections are prepared, except where not deemed necessary, based on engineer's judgement. As part of the reassessment program, Bechtel is currently reviewing the original calculations and supplementing them with additional documentation as necessary.

Response to Recommendation for Resolution

- A. Conduit support Type R3, as shown on drawing E-1406, Sheet 3.24.603 allows four options for connection detail R-12. The four options are attachment to embedded plate, channel or unistrut, and attachment to EAB plate. Calculations for attachment to embedded plate and channel, and attachment to EAB plate were previously evaluated in calculation 677-38(Q), Rev.5, Sheets 214 to 265. The option to bolt to the embedded unistrut was deemed not to be the critical case. Reassessment calculations have been done using conservative assumptions that have verified the initial engineering judgement. This calculation will be transmitted to Sargent & Lundy by June 10, 1985.
- B. Some support type calculations do not have all their allowed connection detail options specifically addressed in the individual support calculation. During the design process, the engineers have done calculations on the same or similar connections for other support types. During this process they have developed knowledge of the capacity of the various details. In a number of cases, the design of some of the options for an individual support type was based on experience developed during the design process and therefore are not documented.
- C. Use of engineering experience, i.e. similar application with a similar load, is an accepted method in the design process. However, as part of the reassessment program, for documentation purposes, each connection for all supports will be addressed. For each support type the adequacy of connections will be documented either by comparison to a generic connection capacity calculation, which is in progress, or calculations or statements in the individual calculation package.

JUN -5 '85 1233587

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OR No. 43 Rev. 0 Date 5/28/85
R/CR No. 43 Rev. 0 Date 6/5/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

S. Brachay
Discipline Group Supervisor

6/5/85
Date

Leo Miller
Bechtel Project Engineer

6/5/85
Date

4. Public Service Electric and Gas Company review:

MR. G. L. ...
Chief Project Engineer

6/5/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

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Hope Creek Generating Station - Unit 1

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RESOLUTION/COMPLETION REPORT
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OR No. 43 Rev. 0 Date 5/28/85
R/CR No. 43 Rev. 0 Date 6/5/85

Response to Description of Observation

Calculations for HVAC support connections are prepared, except where not deemed necessary, based on engineer's judgement. As part of the reassessment program, Bechtel is currently reviewing the original calculations and supplementing them with additional documentation as necessary.

Response to Recommendation for Resolution

- A. Calculations will be provided to corroborate the original design of HVAC duct support connections for Type M and Type DJ, which were based on experience gained from the design of similar connections. These calculations are in progress and will be transmitted to Sargent & Lundy by June 21, 1985.
- B. We have reviewed our design process to verify that there is no breakdown in the process. The release of HVAC duct supports was permitted without full documentation with the knowledge that the adequacy of connections is assured based on the design of similar connections.
- C. Our calculations are checked and reviewed prior to release as a part of our design process. In addition, we are reviewing all our calculations to confirm the adequacy of the component supports and their connections as part of the as-built reassessment program.

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OR No. 44 Rev. 0 Date 5/28/85
R/CR No. 44 Rev. 0 Date 6/4/85

1. Classification of Observation (by S&L):

 Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

3. Reviewee resolution report by:

G. J. Miller / BCF
Discipline Group Supervisor

May 31, 1985
Date

KB / M. P. Adams
Bechtel Project Engineer

6/4/85
Date

4. Public Service Electric and Gas Company review:

SPS / W. G. ...
Chief Project Engineer

6/4/85
Date

5. S&L's disposition of Resolution/Completion Report:

 Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

 Not significant to safety
 Significant to safety

7. Review Committee signatures:

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OR No. 44 Rev. 0 Date 5/28/85
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2.a 1-P-FD-001-H03

The dead weight of the hardware is approximately 60#, which is negligible compared to the design load 5190#. Hardware weight is 1.2% of the governing load and the actual load used is 6000#. The design calculation has minimum factor of safety of 1.123. Therefore, hardware weight need not be included in the calculation.

1-P-EG-125-H01

The dead weight of the hardware and the supplemental structure is approximately 390#, which is less than 10% of the governing design load of 3950#. The design calculation has minimum factor of safety of 1.16. Therefore, the hardware weight need not be included in the calculation.

For other conservatisms in design calculation, please refer to Item 4.a, paragraphs 4 and 5.

2.b 1-P-FD-001-H03

Please refer to Item 4.a

1-P-EG-125-H01

Consideration of self-weight excitation of the structure is not required, as the hanger would be inactive during dynamic conditions. However, the hanger was checked for topping and bottoming out for dynamic conditions and was found acceptable

2.c 1-P-FD-001-H03

Forces due to hot condition were considered in the calculation (see Calculation Sheet 4 of 1-P-FD-001-C10).

1-P-EG-125-H01

Hot condition movement in this case is negligible (.42°) and need not be considered.

- 2.b The seismic self-weight excitation of the component hardware and auxiliary support steel were not considered to check the member and connection stresses for the following reasons:

1. The maximum zero period acceleration (ZPA) 'g' values from various response spectra for different buildings (for 2% damping) were found to be 1.0 for vertical and 0.5 for the horizontal directions.
2. Dead weight of the hardware and structure in comparison to the design load was very small (less than 10% in most cases) and was added absolutely in the vertical direction. The same method of absolute load sum combination was used also for frames

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with multiple pipe supports. The industry practice is to use the SRSS method for making load combinations for such types of frames. Use of the absolute load sum combination method is more conservative.

3. The Code allows for actual dynamic analysis of structures, but a more conservative method of static analysis was used.
4. All allowables for the supplementary structures were considered for 300°F temperature condition, which was conservative.
5. '83 NF Code has higher allowables than '74 Code. The pipe support designs were based on the '74 Code. Per NA-1140 section of the ASME Section III Code, a later issue of a Code is permitted. A request has been filed with the NRC for the use of '83 NF Code allowables since the project meets the related requirements.
6. A 15% additional load was included in design calculations.
7. The friction loads were considered for all loading conditions. However, it needed to be considered with the normal loading condition only.

It is estimated that these conservatisms would result in design margins in excess of 40%, which would accommodate the slight increase in the design stresses due to self-weight excitation of the structure and hardware.

Therefore, the current design method is adequate and meets FSAR commitments.

- 4.b The foregoing establishes that load eccentricity on auxiliary steel has been considered where appropriate.
- 4.c The effects of self-weight, seismic self-weight excitation and eccentricities on auxiliary steel have been accounted for where applicable, as evidenced in this response.

JUN -3 '85 0283494

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 1 of 2

RESOLUTION/COMPLETION REPORT

OR No. 46 Rev. 0 Date 5/28/85
R/CR No. 46 Rev. 0 Date 6/3/85

1. Classification of Observation (by S&L):

☐ Not significant to safety
☐ Significant to safety
☒ Additional Information required

2. Reviewee proposed resolution:

See Sheet 2.

3. Reviewee resolution report by:

9. Kenneth Cooke
Discipline Group Supervisor

5/31/85
Date

[Signature]
Bechtel Project Engineer

6/3/85
Date

4. Public Service Electric and Gas Company review:

William Bailey
Chief Project Engineer

6/3/85
Date

5. S&L's disposition of Resolution/Completion Report:

☐ Observation invalid and withdrawn.
☐ Proposed resolution/future action acceptable,
observation closed.
☐ Additional action to be taken by Reviewee (provide
additional information).

6. Final classification of observation by Review Committee:

☐ Not significant to safety
☐ Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 46 Rev. 0 Date 5/28/85
R/CR No. 46 Rev. 0 Date 6/3/85

4. Calculation 17 A(Q) "Control Transformer Selection and Maximum Circuit Wire Lengths for MCC Control Circuits", Rev.0, dated 4-4-83, has never been officially issued. Our Project Design office microfilm retrieval index shows that the calculation 17 A(Q), Rev.0, was officially issued on 4-4-84. Our electrical discipline project stick file and our calculation index binder show that this 4-4-84 version is our official calculation. The difference between the 4-4-83 version (has never been issued officially) and the 4-4-84 version is an additional sheet (Sh.18) that shows the simultaneous energization of starter coil or M relay and agastat timer followed by a solenoid valve for better illustration only.

Calculation 17 A(Q), Rev.0, 4-4-83 version was mistakenly pulled out from an engineer's personal copy file and sent to Sargent & Lundy on February 3, 1985 for reference. This has been determined to be an isolated occurrence. A copy of Project Design Office document microfilm retrieval index and electrical calculation index are attached for your information and to show that Rev.0, dated 4/4/84, for Calc. 17 A(Q) are the proper revision number and date.

REC NUM	JOB	SUB	UNIT	DEPT	TYPE	IDENTIFICATION	DOCUMENT DESCRIPTION	FN	NF	FILM-ID	RRF-LOC	REC-TYPE
1248575	10855	000	00	C1	CALC	E 15 Q	P			77-0039		D
1248576	10855	000	00	C1	CALC	E 15 (Q)	P	110575		75-0688		D
1248577	10855	000	00	C1	CALC	E 16	REV 0 780208	P		78-0124		D
1248579	10855	000	00	C1	CALC	E 16	REV 1 093082			84-1179	08615	D
1248579	10855	000	00	C1	CALC	E 17A	REV 0 040484			84-1179	08615	D
1248580	10855	000	00	C1	CALC	E 17B	REV 0 022883			84-1179	08615	D
1248581	10855	000	00	C1	CALC	E 17C	REV 0 011784			84-1179	08615	D
1248582	10855	000	00	C1	CALC	E 001	P			75-0456		D
1248583	10855	000	00	C1	CALC	E 001	P			75-0498		D
1248584	10855	000	00	C1	CALC	E 002	P			75-0456		D
1248585	10855	000	00	C1	CALC	E 002	P			75-0498		D
1248586	10855	000	00	C1	CALC	E 003	P			75-0456		D
1248587	10855	000	00	C1	CALC	E 003	P			75-0498		D
1248588	10855	000	00	C1	CALC	E 004	P			75-0456		D
1248589	10855	000	00	C1	CALC	E 004	P			75-0498		D
1248590	10855	000	00	C1	CALC	E 005	P			75-0456		D
1248591	10855	000	00	C1	CALC	E 005	P			75-0498		D
1248592	10855	000	00	C1	CALC	E 006	P			75-0456		D
1248593	10855	000	00	C1	CALC	E 006	P			75-0498		D
1248594	10855	000	00	C1	CALC	E 007	P			75-0456		D
1248595	10855	000	00	C1	CALC	E 007	P			75-0498		D
1248596	10855	000	00	C1	CALC	E 008	P			75-0456		D
1248597	10855	000	00	C1	CALC	E 008	P			75-0498		D
1248598	10855	000	00	C1	CALC	E 009	P			75-0456		D
1248599	10855	000	00	C1	CALC	E 009	P			75-0498		D
1248600	10855	000	00	C1	CALC	E 010	P			75-0456		D
1248601	10855	000	00	C1	CALC	E 010	P			75-0498		D
1248602	10855	000	00	C1	CALC	E 011	P			75-0456		D
1248603	10855	000	00	C1	CALC	E 011	P			75-0498		D
1248604	10855	000	00	C1	CALC	E 012	P			75-0456		D
1248605	10855	000	00	C1	CALC	E 012	P			75-0498		D
1248606	10855	000	00	C1	CALC	E 013	P			75-0456		D
1248607	10855	000	00	C1	CALC	E 013	P			75-0498		D
1248608	10855	000	00	C1	CALC	E 014	P			75-0456		D
1248609	10855	000	00	C1	CALC	E 015	P			75-0456		D
1248610	10855	000	00	C1	CALC	E 015	P			75-0498		D
1248611	10855	000	00	C1	CALC	E 016	P			75-0456		D
1248612	10855	000	00	C1	CALC	E 016	P			75-0498		D
1248613	10855	000	00	C1	CALC	E 017	P			75-0456		D
1248614	10855	000	00	C1	CALC	E 017	P			75-0498		D
1248615	10855	000	00	C1	CALC	E 018	P			75-0456		D
1248616	10855	000	00	C1	CALC	E 018	P			75-0498		D
1248617	10855	000	00	C1	CALC	E 019	P			75-0456		D
1248618	10855	000	00	C1	CALC	E 019	P			75-0498		D
1248619	10855	000	00	C1	CALC	E 020	P			75-0456		D
1248620	10855	000	00	C1	CALC	E 020	P			75-0498		D
1248621	10855	000	00	C1	CALC	E 021	P			75-0456		D
1248622	10855	000	00	C1	CALC	E 021	P			75-0498		D
1248623	10855	000	00	C1	CALC	E 022	P			75-0456		D
1248624	10855	000	00	C1	CALC	E 022	P			75-0498		D

JUN -3 85 0283494

HOPE CREEK GENERATING STATION NOS 1 & 2 UNITS

JOB 10855

CALCULATION INDEX

DISCIPLINE: ELECTRICAL

CALC NO.	TITLE	BINDER LOCATION	OTHER CROSS-REFERENCE (OPTIONAL) Micro:		
15(Q)	Load Flow Study	PRELIM			
		12 CPCD	Rev. 1	11-10-76	77-00
		25 FINAL	Rev. 2	2-5-85	2-15-85 85-25
		32 SUPER	Rev. 0	09-12-75	11-05 75-68
16	Billing Metering Totalizing	1 PRELIM	Rev. 0	11-23-77	78-01 02-09
		CPCD			
		24 FINAL	Rev. 1	9-30-82	8-29-82 82-82
		SUPER			
17(Q)	Voltage Drop Study for 125V dc and	1 PRELIM	Rev. 0	5-29-79	1-12-81 SEP 81
Chief's review	120V ac Control Circuits	CPCD			
is not needed		FINAL			
	<i>Superseded by 17A, B, C</i>	SUPER			
17A(Q)	CONTROL TRANSFORMER SELECTION & MAX CIRCUIT WIRE LENGTHS FOR MCC CONTROL CIRCUITS	PRELIM	THIS CALC. SUPERSEDED BY CALC. 17(Q)		
		CPCD			
		24 FINAL	REV 0	4-4-84	8-1-84 84-84
		SUPER			
		PRELIM			
		CPCD			
		FINAL			
		SUPER			
15.1(Q)	MILLSTONE VOLTAGE STUDY-1E BUSES	PRELIM			
		11 CPCD	REV 0	10/5/83	
		25 FINAL	REV 1	2-25-85	3-7-86 CARTE
		SUPER			353
17C(Q)	125V DC CONTROL CIRCUIT LENGTHS FOR DC MCC STARTERS	PRELIM			
		CPCD			
		24 FINAL	REV. 0	1-17-84	1-25-84 SEP 84 2-27-84 2-27-84
		SUPER			
17B(Q)	VOLTAGE DROP FOR 125V DC CONTROL CIRCUIT	PRELIM			
		CPCD			
		24 FINAL	REV. 0	2-28-83	2-28-83 2-28-83
		SUPER			

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 1 of 2

RESOLUTION/COMPLETION REPORT

OR No. 47 Rev. 0 Date 5/28/85
R/CR No. 47 Rev. 0 Date 6/4/85

1. Classification of Observation (by S&L):

- Not significant to safety
 Significant to safety
 X Additional Information required

2. Reviewee proposed resolution:

(See sheet, 2)

3. Reviewee resolution report by:

gpc Kenneth Cooke
Discipline Group Supervisor

6/4/85
Date

G. N. Kondratie
Bechtel Project Engineer

6/4/85
Date

4. Public Service Electric and Gas Company review:

gpc W. Smith
Chief Project Engineer

6/4/85
Date

5. S&L's disposition of Resolution/Completion Report:

- Observation invalid and withdrawn.
 Proposed resolution/future action acceptable,
 observation closed.
 Additional action to be taken by Reviewee (provide
 additional information).

6. Final classification of observation by Review Committee:

- Not significant to safety
 Significant to safety

7. Review Committee signatures:

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Project No. 10855-013
Page 2 of 2

RESOLUTION/COMPLETION REPORT
(Continuation sheet)

OR No. 47 Rev. 0 Date 5/28/85
R/CR No. 47 Rev. 0 Date 6/4/85

2. DESCRIPTION OF OBSERVATION

The essence of O.R.#47 is that the qualification report for ASCO solenoid valves does not consider the temperature rise associated with an energized coil during thermal aging and its contribution to the degradation of the coil.

Contrary to the S/L observation, the qualification testing performed by ASCO, and documented in the test report does account for the heat rise due to coil energization. The objective of the testing was to qualify valves for continuous duty (i.e. constantly energized service). The thermal aging program was conducted in a manner to replicate the service conditions of a continuously energized coil. This information is contained in the qualification document package previously submitted for P/O #J601Q-126-1, page 11, section 4.1.1.

Please note that the solenoid valves in question are identified on the attachment to the PSE&G EESS sheet #J601-SV-001. Valves SV-F051 A&B and SV-F053 A&B are no longer in service; these valves will be deleted from the EESS. The remaining valves on the sheet will be used intermittently during normal or DBE conditions as system requirements dictate; they are not continuously energized during these conditions.

4. RECOMMENDATION FOR RESOLUTION

- A. The discussion provided above in Section 2 provides adequate justification for the methodology used to evaluate the thermal effects on qualified life of the solenoid valves.
- B. Reply is not required based on response to A.
- C. Reply is not required based on response to A.

~~Enclosure~~

Wang

PDR

**SARGENT & LUNDY
ENGINEERS**

FOUNDED 1891

88 EAST MONROE STREET

CHICAGO, ILLINOIS 60603

(312) 269-2000

TWX 910-221-2807

H. STEPHEN TAYLOR
ASSOCIATE
312-269-6371

LSP- 49

June 5, 1985

Project No. 7212-30

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Independent Design Verification Program
Observation Reports

Mr. W. F. Bauer
Principal Engineer
Public Service Electric and Gas Company
80 Park Plaza
Newark, New Jersey 07101

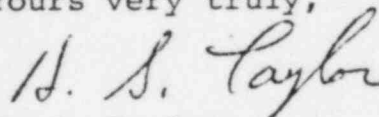
Dear Mr. Bauer:

Enclosed for your information and action is one copy each of
Observation Reports Nos. 49 and 51 through 60 resulting from the
IDVP of the Hope Creek Generating Station.

The Observation Reports should be reviewed and the Resolution Report
sheets completed and signed by Bechtel and PSE&GC and returned as
soon as possible. Return of original documents should be via Federal
Express or equivalent overnight service in order to facilitate S&L's
disposition of the Observation Reports.

Any questions you or Bechtel may have concerning these Observation
Reports should be addressed in accordance with the Program Plan
Protocol.

Yours very truly,



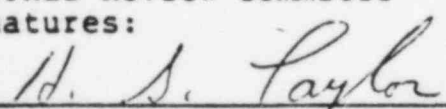
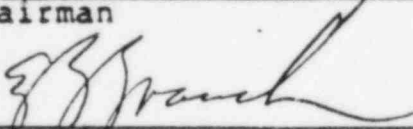
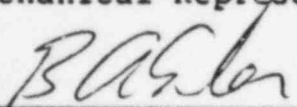
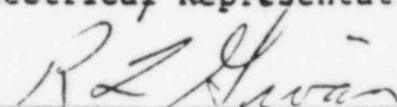
H. S. Taylor
Chairman, Internal Review Committee

HST:nd
Enclosures
Copies:
T. Delgaizo
J. L. Milhoan
L. C. Oesterich
P. L. Wattelet
W. A. Bloss (2)
O. Zaben
W. D. Crumpacker
T. J. Duffy
H. G. L. McCullough
R. M. Schiavoni
D. P. White

OBSERVATION REPORT

OR No. 49, Rev. 0, Date 6/3/85

1. **Structure(s), system(s), or component(s) involved:**
HPCI System Suppression Chamber Level Transmitter LT-4805-1,2
P&ID M-55-1, Rev. 12, dated 12/06/84
Instrument Isometric Drawing FSK-JD-1801-1-003-1, Rev. 3, dated 1/31/85
2. **Description of Observation:**
In reviewing the instrument loops which contain level transmitters LT-4805-1,2 for compliance with technical specification J-825(Q), "Control System Instrument Installation Procedures" and Design
(continued on next page)
3. **Significance of Observation:**
The noted apparent conflicting information causes concerns with respect to what the correct design is and how the interfaces between BPC Design, GE and BPC Construction are controlled and documented.
4. **Recommendation for resolution (optional):**
 - a. BPC should confirm the discrepancies noted in this OR and correct the appropriate documents.
(continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

<div style="text-align: center;"> _____ Chairman</div> <div style="text-align: center;"> _____ Mechanical Representative</div> <div style="text-align: center;"> _____ Structural Representative</div>	<div style="text-align: center;"><div style="display: inline-block; vertical-align: middle;">L. R. STENSLAND</div> / <div style="display: inline-block; vertical-align: middle;">by C. M. Chiccapella</div> _____ Electrical Representative</div> <div style="text-align: center;"> _____ Control and Instrumentation Representative</div>
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OBSERVATION REPORT

OR No. 49, Rev. 0, Date 6/3/85

1. Structure(s), system(s), or component(s) involved: (continuation)

Instrument Index, dated 2/9/85
Instrument Data Sheet B03, Rev. 6, dated 7/20/84
Instrument Setpoint Calculation 121, Rev. 0, dated 12/21/84

2. Description of Observation: (continuation)

Guide J-2.6.4, "Instrument Setpoints," the following discrepancies were noted:

P&ID M-55-1, Rev. 12, dated 12/6/84 and instrument isometric FSK-JD-1801-1-003-1, Rev. 3, dated 1/31/85 show these transmitters as capillary type transmitters.

Instrument Index, dated 2/9/85, for these transmitters lists a purchased specification of J-301(Q) Data Sheet B03.

Data Sheet B03, Rev. 6, dated 7/20/84 of specification J-301(Q), specifies Tobar transmitters but shows LT-4805-1,2 as spares.

Setpoint Calculation No. 121, Rev. 0, dated 12/21/84 shows transmitters LT-4805-1,2 as a Rosemount 1153D, Code 5 LT, which is a non-capillary type transmitter.

4. Recommendation for Resolution (optional): (continuation)

- b. BPC should provide assurance that the discrepant information was not implemented in the design.
- c. Identify the causes of the discrepancies, the design process which should have prevented them, and why that process did not prevent the discrepancies.
- d. BPC should provide assurance that the correct design process has been applied to all other instruments and that discrepancies noted in this OR are not prevalent in the design and procurement.

OBSERVATION REPORT

OR No. 51, Rev. 0, Date 6/5/85

1. **Structure(s), system(s), or component(s) involved:**
Setpoint calculations No. 121, Rev. 0, dated 1/10/85; No. 123, Rev. 1, dated 3/26/85; No. 104, Rev. 1, dated 3/25/85; Design Guide J-2.6.4, Rev. 0, dated 1/29/79; EDP 4.37, Rev. 13, FSAR Section 1.8.1.105
2. **Description of Observation:**
FSAR Section 1.8.1.105 states that HCGS will comply with Regulatory Guide 1.105, "Instrument Setpoints." Per Regulatory Guide 1.105 and Design Guide J-2.6.4, Rev. 0, dated 1/29/79,
(continued on next page)
3. **Significance of Observation:**
 - a. The use of the ambient temperature for the applicable instrument location in the setpoint calculations instead of the accident temperature does not appear to be an
(continued on next page)
4. **Recommendation for resolution (optional):**
 - a. BPC should justify the use of ambient environment temperatures in lieu of accident environment temperatures for the transmitter temperature coefficient calculations in the referenced
(continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.

7. **Internal Review Committee Signatures:**

D. S. Taylor
Chairman

[Signature]
Mechanical Representative

[Signature]
Structural Representative

L.R. STENSLAND / by C.M. Chappetta
Electrical Representative

[Signature]
Control and Instrumentation Representative

OBSERVATION REPORT

OR No. 51, Rev. 0, Date 6/5/85

2. Description of Observation: (continuation)

"Instrument Setpoints," the accident environmental effects on the instruments must be taken into account as part of the setpoint calculation. Contrary to this requirement, the Bechtel setpoint calculations have been issued without accounting for accident environmental effects.

Bechtel stated that these calculations are, "Committed Calculations" and are using information which is not necessarily final and may be subject to change (per EDP 4.37). There is no objective evidence that Bechtel plans to include accident environmental effect as part of the calculation. The issued calculations only references the normal environment.

3. Significance of Observation: (continuation)

appropriate use of "committed calculations" per EDP 4.37.

- b. EDP 4.37 does not appear to require any notation of what data in a calculation is "not final and may be subject to change" so that future finalization of the calculation can be accomplished to revise all of the data which was subject to change.

4. Recommendation for Resolution (optional): (continuation)

calculations or confirm that the usage was a contributor to the calculations classification of "committed calculation."

- b. BPC should justify that the use of ambient temperature, which is the only temperature specified on the setpoint calculation form, in place of the accident temperature in instrument setpoint calculations is appropriate use of the "committed calculation" category per EDP 4.37 as stated.
- c. BPC should provide an explanation of how data which is not final and subject to change can be identified in calculations per EDP 4.37 so that future finalization of the calculation can be accomplished.
- d. BPC should provide assurance that all data which was not final and subject to change has been revised or confirmed to be final in all calculations which were "committed" calculations and have been made "final" calculations.

OBSERVATION REPORT

OR No. 52, Rev. 0, Date 6/3/85

1. **Structure(s), system(s), or component(s) involved:**
Batteries for Class 1E 125V and 250V Systems
References: Battery and Charger Sizing Calculations, 4.1(Q),
Rev. 4, dated 10/12/84 and 5.1(Q), Rev. 2, dated 3/14/84
(continued on next page)
2. **Description of Observation:**
The referenced battery sizing calculations identify the lowest
expected electrolyte temperature as 77°F. The referenced DC
System Design Criteria states the battery room temperature
(continued on next page)
3. **Significance of Observation:**
The battery sizing calculation procedure (IEEE Standard 485)
includes a temperature correction factor to compensate for the
reduced battery capacity at temperatures less than the standard
(continued on next page)
4. **Recommendation for resolution (optional):**
BPC should verify that the HVAC system is designed to limit the
minimum temperature in the battery rooms in accordance with the
Design Criteria for the DC system.
(continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of
Observation or additional information required:**
Additional information is required to evaluate safety significance.
Provide information requested in Item 4.

7. **Internal Review Committee
Signatures:**

H. S. Taylor
Chairman

[Signature]
Mechanical Representative

[Signature]
Structural Representative

L. R. STENSLAND / By C. M. Chappella
Electrical Representative

[Signature]
Control and Instrumentation
Representative

OBSERVATION REPORT

OR No. 52, Rev. 0, Date 6/3/85

1. Structure(s), System(s), or component(s) involved:

DC System Design Criteria 10855-D4.3, Rev. 4
FSAR Table 3.11-1C, page 4
Battery Specification 10855-E-150(Q), Rev. 5,
dated 3/15/84

2. Description of Observation: (continuation)

range as 77+ 50°F. The referenced FSAR Table (Environmental Parameters) identifies the minimum battery room temperature as 74°F. The referenced Battery Specification specifies that the cells shall be of the proper rating to meet the duty cycle at a battery temperature of 77°F.

3. Significance of Observation: (continuation)

battery rating temperature of 77°F. Incorporation of the temperature correction factor for 72°F (minimum temperature per Plant Design Criteria for the DC system) may reduce the available design margin for future loads to less than 10% committed to in the FSAR (Section 8.3.2.1.2.2). While a reduction in the batteries design margin may not be significant (to be verified by BPC), the concern is that a failure to incorporate FSAR commitments in the design process may reduce margin below an acceptable level in other areas of the design. The discrepancy between various documents also indicate that the interface procedures between various departments may not be well defined.

4. Recommendation for Resolution (optional): (continuation)

BPC should reconcile the battery sizing calculations and the FSAR to reflect the minimum ambient temperature. If necessary, this reconciliation should include FSAR statements concerning the design margin for future load additions.

BPC should identify the procedures which ensure consistency between specifications, calculations, design criteria and other documents to reflect FSAR commitments.

BPC should identify the procedures which define interfaces between the equipment qualification group and electrical systems design group concerning transmittal of environmental design parameters and updating of design documents to reflect these parameters.

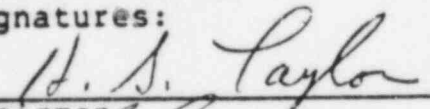

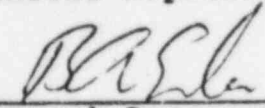
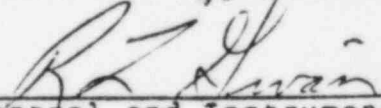
BPC should provide assurance that this observation is an isolated occurrence.

BPC should identify the cause of the discrepancies, the design control process which should have prevented them, and why that process did not prevent the discrepancies.

OBSERVATION REPORT

OR No. 53, Rev. 0, Date 6/3/85

1. **Structure(s), system(s), or component(s) involved:**
Bechtel Design Specification 10855-M-067(Q), Rev. 2, (8/1/83)
and Rev. 4 (4/8/85) for Nuclear Power Piping, ASME Section III,
Class 1
2. **Description of Observation:**
FSAR Section 3.6.2.1.1.1 provides criteria for Class 1 high
energy piping in containment penetration areas. It includes
criteria for acceptance of stresses that are more conservative
(continued on next page)
3. **Significance of Observation:**
There is an apparent lack of implementing a licensing commitment.
There is a possibility that piping stress analysis for certain
Class 1 piping may use less conservative criteria than is
required by the FSAR.
4. **Recommendation for resolution (optional):**
 - a. BPC should revise the Design Specification to agree with
the FSAR. (continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of
Observation or additional information required:**
Additional information is required to evaluate safety significance.
Provide information requested in Item 4.
7. **Internal Review Committee
Signatures:**

<div style="text-align: center;"> _____ Chairman</div> <div style="text-align: center;"> _____ Mechanical Representative</div> <div style="text-align: center;"> _____ Structural Representative</div>	<div style="text-align: center;"><div style="display: inline-block; vertical-align: middle;">L. R. STENSLAND</div> / <div style="display: inline-block; vertical-align: middle;">by C. M. Chippella</div> _____ Electrical Representative</div> <div style="text-align: center;"> _____ Control and Instrumentation Representative</div>
---	---

OBSERVATION REPORT

OR No. 53, Rev. 0, Date 6/3/85

2. Description of Observation: (continuation)

than required by the ASME Code so that the postulation of pipe breaks can be waived for the piping between containment isolation valves.

Section 3.2 in Rev. 2 of the Design Specification appears to be inconsistent with the requirements of FSAR Section 3.6.2.1.1.1. The Design Specification allows the use of code equation (10) between the maximum stress intensity range of $2.4S_m$ and $3.0S_m$ whereas the FSAR requires the use of code equations (12) and (13) for the range exceeding $2.4S_m$.

However, Rev. 4 of the Design Specification deleted Section 3.2, leaving only acceptance criteria for all pipe as written in ASME-III. Thus, Rev. 4 provides acceptance at a $3.0S_m$ (NB-3653, NB-3644) allowable, whereas, the FSAR requires acceptance at $2.4S_m$. Secondly, NB-3222 and NB-3223 provides acceptance criteria of 1.0 cumulative usage factor, whereas, the FSAR requires acceptance at 1/10 that value (0.1). Rev. 4 of the design specification does not appear to provide the lower acceptance criteria required by the FSAR to alleviate postulation of pipe breaks in the piping between containment isolation valves.

4. Recommendation for Resolution (optional): (continuation)

- b. BPC should provide assurance that the FSAR requirement has been properly implemented in the piping stress analysis for Class 1 piping penetrating the containment.
- c. BPC should identify the cause of this discrepancy, the design control process that should have prevented it, and why that process did not prevent the discrepancy.
- d. BPC should describe the process for assuring consistency between the FSAR and design documents.

OBSERVATION REPORT

OR No. 54, Rev. 0, Date 6/5/85

1. **Structure(s), system(s), or component(s) involved:**
HPCI System, Line 1BJ-HBB-003 (HPCI Pump Discharge)
Line Index 10855-P-0501, Rev. 17 (9/24/84)
2. **Description of Observation:**
FSAR, Section 3.2 commits to ASME-III. ASME-III, NX-3641.1 requires calculation of minimum pipe wall thickness, taking into account design pressure and temperature. Bechtel Line
(continued on next page)
3. **Significance of Observation:**
Use of outdated design information in pipe wall thickness calculations could result in installed wall thicknesses that do not meet ASME-III requirements.
4. **Recommendation for resolution (optional):**
 - a. The calculation, Rev. 5, was revised to correct the above discrepancy, but the new Rev. 6 was not correctly documented. BPC should revise Rev. 6 to show the
(continued on next page)
5. **Internal Review Committee classification of Observation:**
 Not significant to safety (See Item 6)
 X Additional information required (See Item 6)
 Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.

7. **Internal Review Committee Signatures:**

H. S. Taylor
Chairman

[Signature]
Mechanical Representative

[Signature]
Structural Representative

L.R. SIENSLAND / G.M. Chioppella
Electrical Representative

[Signature]
Control and Instrumentation Representative

OBSERVATION REPORT

OR No. 54, Rev. 0, Date 6/5/85

2. Description of Observation: (continuation)

Index 10855-P-0501, Rev. 17 (9/24/84), shows design ratings greater than those used in Bechtel Calculation No. 1(Q), Rev. 5 (4/15/81) for wall thickness calculations for piping. The following are examples:

Line No.	Line Index Design		Wall Thickness Calculations		
	Press.	Temp.	Press.	Temp.	Sheet No.
BJ-HBB-033	1375	170	1350	140	13
EG-HBC-157, 8	180	212	163	340	80
EG-HBC-797, 801, 815, 816	200	125	163	340	80

Revision 6 of the Wall Thickness Calculation, dated April 23, 1985 (issued after the IDVP cutoff date), sheets 131 and 150 show the calculations for the lines based upon values as shown in the line index.

However, Rev. 6 does not show that sheets 13 and 80 have been superseded by sheets 131 and 150, respectively.

4. Recommendation for Resolution (optional): (continuation)

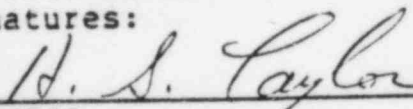
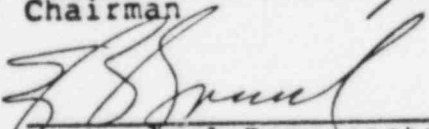
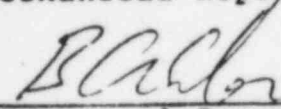
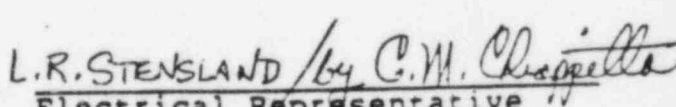

superseding of appropriate pages in accordance with EDP 4.37.

- b. BPC should provide assurance that wall thickness calculations of other SR piping are consistent with current line index design ratings.
- c. BPC should identify the cause of the discrepancies, the design control process which should have prevented them, and why that process did not prevent the discrepancies.
- d. BPC should describe the design process that controls changes to line index data, which affect design calculations for pressure retaining components and how these changes are reconciled with the calculations.
- e. BPC should provide assurance that the three subject pressure and temperature values listed in the line index are consistent with the system service condition established by the functional calculation.

OBSERVATION REPORT

OR No. 55, Rev. 0, Date 6/5/85

1. **Structure(s), system(s), or component(s) involved:**
Safety-related structures, systems and components in the reactor building subjected to consequences of jet impingements following a line rupture.
(continued on next page)
2. **Description of Observation:**
FSAR 3.6.1.b reads in part:
"Jet impingement loads in the reactor building are reviewed along with other pipe break effects on a compartment-by-compartment basis."
(continued on next page)
3. **Significance of Observation:**
The potential exists that the above FSAR commitment for the effects of jet impingement loads may not have been met.
4. **Recommendation for resolution (optional):**
BPC should provide documentation that the jet impingement analysis committed to in the FSAR has been adequately performed.
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

<div style="text-align: center;"> _____ Chairman</div> <div style="text-align: center;"> _____ Mechanical Representative</div> <div style="text-align: center;"> _____ Structural Representative</div>	<div style="text-align: center;"> _____ Electrical Representative</div> <div style="text-align: center;"> _____ Control and Instrumentation Representative</div>
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OBSERVATION REPORT

OR No. 55, Rev. 0, Date 6/5/85

1. Structure(s), System(s), or component(s) involved:
 - a. BPC Calculation 10855-11-67(Q), Rev. 0, (8/2/82)
 - b. BPC Calculation 10855-11-60(Q), Rev. 0, (3/23/82)
 - c. BPC Calculation 10855-11-58(Q), Rev. 0, (3/2/82)

2. Description of Observation:

Structures designed to enclose and separate high energy piping from essential safety-related equipment are designed to sustain the predicted jet impingement and pipe whip loads. Loss of safety-related systems occupying the compartment where the postulated pipe break occurs is considered in the evaluation of the plant's ability to shut down, cool down or isolate."

The jet geometry and pressures have been calculated for a break in the high/moderate energy lines in the reactor building as per reference a, b, and c. However, no documented evidence has been provided that this information was then used as input to an analysis which assesses the potential jet impingement effects.

OBSERVATION REPORT

OR No. 56, Rev. 0, Date 6/3/85

1. **Structure(s), system(s), or component(s) involved:**
Safety-related structures, systems and components subjected to consequences of postulated breaks in Main Steam Drain Lines. Design Criteria, Procedure for Documentation and Criteria for Plant Separation, 10855-D7.3, Rev. 1, (4/2/84)
2. **Description of Observation:**
FSAR, Section 3.6.1.2 states in part:
"For each pipe rupture location determined in accordance with the criteria of Section 3.6.2.1, an analysis is performed using the
(continued on next page)"
3. **Significance of Observation:**
It cannot be adequately determined that essential systems and components necessary to achieve a safe shutdown are protected from the consequences of postulated breaks in the main steam drain lines.
4. **Recommendation for resolution (optional):**
a. BPC should provide justification for the lack of documented analyses for the main steam drain line pipe break or
(continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.

7. **Internal Review Committee Signatures:**

H. S. Taylor
Chairman

[Signature]
Mechanical Representative

[Signature]
Structural Representative

L.R. STENSLAND / by C.M. Chappella
Electrical Representative

[Signature]
Control and Instrumentation Representative

OBSERVATION REPORT

OR No. 56, Rev. 0, Date 6/3/85

2. Description of Observation: (continuation)

assumptions of Section 3.6.1.1 to verify that the consequences of the pipe rupture are acceptable."

FSAR, Section 3.6.1.2.1.8 states in part:

"A combination of pipe whip restraints and separation by distance or intervening structures is used to ensure the availability of essential systems and components in the event of a main steam drain line break in either the drywell or the main steam tunnel."

Documented evidence demonstrating that these FSAR commitments are met has not been provided for the main steam drain line break.

4. Recommendation for Resolution (optional): (continuation)

BPC should provide documentation that the main steam drain line pipe break analysis committed to in the FSAR has been adequately performed.

- b. BPC should establish if there are any other pipe rupture analyses required by the FSAR which have not been performed and how these items are controlled and closed out.

OBSERVATION REPORT

OR No. 57, Rev. 0, Date 6/3/85

1. **Structure(s), system(s), or component(s) involved:**
Safety-related structures, systems and components subjected to consequences of a water spray following a line rupture.
2. **Description of Observation:**
FSAR, Section 3.6.1d states:
"Water spray - Water spray itself is a hazard to certain equipment, particularly electrical equipment. In most cases, spatial
(continued on next page)
3. **Significance of Observation:**
The potential exists that the above FSAR commitment for water spray assessment may not have been met.
4. **Recommendation for resolution (optional):**
BPC should provide documentation that the analysis for water spray committed to in the FSAR has been adequately performed.
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

H. S. Taylor
Chairman

[Signature]
Mechanical Representative

[Signature]
Structural Representative

L.R. STENSLAND by C.M. Chappetta
Electrical Representative

R. L. Swan
Control and Instrumentation Representative

OBSERVATION REPORT

OR No. 57, Rev. 0, Date 6/3/85

2. Description of Observation: (continuation)

separation and intermediate obstructions are adequate to prevent spray from reaching the equipment. Essential equipment, i.e., equipment that is required to operate under and/or mitigate the accident condition and that can potentially be subjected to water spray, is either designed to operate when wetted, or is protected from water spray where necessary by barriers or equipment enclosure."

No documented evidence has been provided to demonstrate that this FSAR commitment has been met.

OBSERVATION REPORT

OR No. 58, Rev. 0, Date 6/5/85

1. **Structure(s), system(s), or component(s) involved:**
Safety-related structures, systems and components subjected to consequences of HELB's/MELB's.
Design Criteria, Procedure for Documentation and Criteria for Plant Separation, 10855-D7.3, Rev. 1, (4/2/84)
2. **Description of Observation:**
FSAR, Section 3.6.1.2, reads in part:
"For each pipe rupture location determined in accordance with the criteria of Section 3.6.2.1, an analysis is performed using
(continued on next page)"
3. **Significance of Observation:**
The potential exists that the FSAR commitment for pipe break analysis may not have been met. See Observation Report Nos. 55, 56 and 57.
4. **Recommendation for resolution (optional):**
a. BPC should provide complete documentation of the analysis to support the above item and provide assurance that all other conclusions in the separation review data sheets have backup documentation.
(continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

H. S. Taylor
Chairman

[Signature]
Mechanical Representative

[Signature]
Structural Representative

L.R. STENSLAND / by C.M. Chappelle
Electrical Representative

[Signature]
Control and Instrumentation Representative

OBSERVATION REPORT

OR No. 58, Rev. 0, Date 6/5/85

2. Description of Observation: (continuation)

the assumptions of Section 3.6.1.1 to verify that the consequences of the pipe rupture are acceptable."

The Separation Review Data Sheets (Appendix E of D7.3), intended as documentation for the analysis required by the FSAR, do not alone adequately document compliance with the above licensing commitment.

The Separation Review Data Sheets lack back-up documentation (i.e., specific calculations, failure mode and effects analysis, etc.) which supports the licensing commitments, in the following typical areas:

- a. Postulated pipe break locations.
- b. Pipe rupture consequence effects.
- c. Analyses using assumptions of the FSAR, Section 3.6.1.1 showing that rupture effects are acceptable.

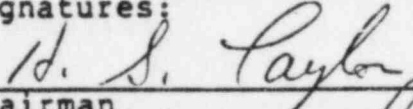
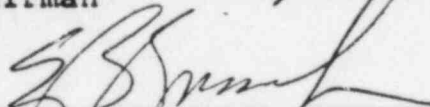
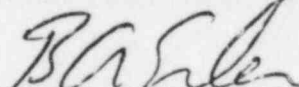
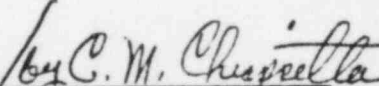

4. Recommendation for Resolution (optional): (continuation)

- b. If it is BPC's position that the separation review data sheets are to be supplemented by other means, BPC should provide the details of the program, including all procedures which will be used to satisfy the FSAR commitments.

OBSERVATION REPORT

OR No. 59, Rev. 0, Date 6/5/85

1. **Structure(s), system(s), or component(s) involved:**
Seismic Qualification Package 10855-P305(Q) for 30" Butterfly Valve 1EG-HV-2522A which contains BIF Report N50934, Book 1, Rev. A (Bechtel Document Control No. 10855-P305(Q)-285-4, Rev. A).
2. **Description of Observation:**
FSAR Section 3.9.3.2.7.2 defines the seismic qualification requirement for demonstrating the operability of Non-NSSS active valves and commits to IEEE-344-1975 which requires valves to be qualified for their installed orientation. (continued on next page)
3. **Significance of Observation:**
This difference in orientation will result in a different stress distribution in the valve body due to the weight of the operator resulting in calculated valve body stresses that may not be conservative.
4. **Recommendation for resolution (optional):**
 - a. BPC/PSE&GC should demonstrate that the subject valve is qualified for its installed orientation.
(continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance
Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

<div style="text-align: center;"> _____ Chairman</div> <div style="text-align: center;"> _____ Mechanical Representative</div> <div style="text-align: center;"> _____ Structural Representative</div>	<div style="text-align: center;"><div style="display: inline-block; vertical-align: middle;">L.R. STENSLAND</div>  _____ Electrical Representative</div> <div style="text-align: center;"> _____ Control and Instrumentation Representative</div>
---	---

OBSERVATION REPORT

OR No. 59, Rev. 0, Date 6/5/85

2. Description of Observation: (continuation)

There is an apparent failure to meet these requirements in that the BIF Report N50934 qualifies the valves for mounting on horizontal pipe runs while the valve data sheet for Valve 1EG-HV-2522A indicates that it is mounted on a riser (vertical pipe run).

4. Recommendation for Resolution (optional): (continuation)

- b. BPC/PSE&GC should provide assurance that orientation is properly considered in the qualification of other safety-related valves.
- c. BPC should identify the cause of the discrepancy, the design control process which should have prevented it, and why that process did not prevent the discrepancy.

OBSERVATION REPORT

OR No. 60, Rev. 0, Date 6/5/85

1. **Structure(s), system(s), or component(s) involved:**
HCGS FSAR Table 3.11-6
4.16KV RRS Pump Motor Breakers, Equipment Nos. 1AN205, 1BN205, 1CN205, and 1DN205.
2. **Description of Observation:**
FSAR Sections 3.11.1.2 and 3.11.2.3 state that environmental qualification is done to meet the intent of NUREG 0588, Category 1 requirements. (continued on next page)
3. **Significance of Observation:**
Because the subject breakers are exempted from all environmental qualification, there is a potential that they may not perform their intended function during an accident.
4. **Recommendation for resolution (optional):**
 - a. BPC/PSE&GC should justify the exemption of the breakers from environmental qualification, or
(continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

H. S. Paylor
Chairman

[Signature]
Mechanical Representative

[Signature]
Structural Representative

L. R. STENSLAND / by C. M. Chappella
Electrical Representative

[Signature]
Control and Instrumentation Representative

OBSERVATION REPORT

OR No. 60, Rev. 0, Date 6/5/85

2. Description of Observation: (continuation)

NUREG 0588, Rev. 01, Section 3, Item 4, requires equipment performing a short term safety function to remain functional for at least one hour in excess of the time assumed in the accident analysis.

The subject breakers are located in areas defined as harsh environment areas in DITS 7.5, Rev. 2.

Thus it appears that the breakers should be qualified to function in a harsh environment for at least one hour.

FSAR Table 3.11-6 denotes the 4.16KV RRS pump motor breakers as performing a short term safety function and exempts them from all environmental qualification requirements. Therefore, FSAR Table 3.11-6 does not meet the intent of NUREG 0588 for these breakers.

4. Recommendation for Resolution (optional): (continuation)

- b. BPC/PSE&GC should provide specific information as to how the observation has or will be corrected. Will the FSAR be revised?
- c. BPC/PSE&GC should assure that all other equipment with a "short term safety function" and located in harsh environment areas are qualified per the intent of NUREG 0588 requirements.
- d. BPC should identify the cause of the discrepancy, the design control process which should have prevented it, and why that process did not prevent the discrepancy.

PDR

**SARGENT & LUNDY
ENGINEERS**

FOUNDED 1891

88 EAST MONROE STREET

CHICAGO, ILLINOIS 60603

(312) 269-2000

TWX 910-221-2807

H. STEPHEN TAYLOR
ASSOCIATE
312-269-8371LSP- 51
June 7, 1985
Project No. 7212-30Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1Independent Design Verification Program
Observation ReportsMr. W. F. Bauer
Principal Engineer
Public Service Electric and Gas Company
80 Park Plaza
Newark, New Jersey 07101

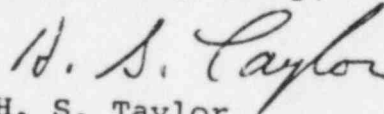
Dear Mr. Bauer:

Enclosed for your information and action is one copy each of Observation Reports Nos. 61 through 65 resulting from the IDVP of the Hope Creek Generating Station.

The Observation Reports should be reviewed and the Resolution Report sheets completed and signed by Bechtel and PSE&GC and returned as soon as possible. Return of original documents should be via Federal Express or equivalent overnight service in order to facilitate S&L's disposition of the Observation Reports.

Any questions you or Bechtel may have concerning these Observation Reports should be addressed in accordance with the Program Plan Protocol.

Yours very truly,

H. S. Taylor
Chairman, Internal Review CommitteeHST:nd
Enclosures
Copies:
T. Delgaizo
J. L. Milhoan
L. C. Oesterich
P. L. Wattelet
W. A. Bloss (2)
O. Zaben
W. D. Crumpacker
T. J. Duffy
H. G. L. McCullough
R. M. Schiavoni
D. P. White

OBSERVATION REPORT

OR No. 61, Rev. 0, Date 6/7/85

1. **Structure(s), system(s), or component(s) involved:**
Conduits: Calculation 677-38(Q), Rev. 5
SRP 3.7.2
2. **Description of Observation:**
Calculations prepared to determine allowable conduit spans included only the fundamental mode of vibration. The effects of higher modes were neglected in the analysis.
3. **Significance of Observation:**
The adequacy of the allowable conduit spans cannot be verified to meet the FSAR seismic commitments.
4. **Recommendation for resolution (optional):**
Provide justification that the participation of higher modes of vibration are insignificant in the determination of dynamic response of all conduit sizes and spans.
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

<div data-bbox="297 1573 925 1681" data-label="Text"><p><u>H. S. Taylor</u> Chairman</p></div> <div data-bbox="297 1681 925 1811" data-label="Text"><p><u>[Signature]</u> Mechanical Representative</p></div> <div data-bbox="297 1811 925 1940" data-label="Text"><p><u>[Signature]</u> Structural Representative</p></div>	<div data-bbox="958 1681 1569 1811" data-label="Text"><p><u>L.R. STENSLAND / by C.M. Chappelle</u> Electrical Representative</p></div> <div data-bbox="958 1811 1569 1983" data-label="Text"><p><u>[Signature]</u> Control and Instrumentation Representative</p></div>
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OBSERVATION REPORT

OR No. 62, Rev. 0, Date 6/7/85

1. **Structure(s), system(s), or component(s) involved:**
Pipe with bends in class 1, 2 and 3 systems
BPC Wall Thickness Calculation 1(Q), Revisions 5 and 6
BPC Specification 10855-P-201(Q), Revision 7
(continued on page 2)
2. **Description of Observation:**
FSAR Section 3.2 commits to ASME-III. ASME-III, NX-3642.1(a),
Pipe Bends, requires the minimum wall after bending to not be
less than the minimum wall thickness required for straight pipe.
(continued on pages 2 and 3)
3. **Significance of Observation:**
There is a potential for pipe at bends to have wall thickness
less than the calculated minimum wall which violates ASME-III,
NX3642.1 and NX-3641.
4. **Recommendation for resolution (optional):**
BPC should provide information on how the observation has or will
be corrected. BPC should specifically:
(continued on page 3)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of
Observation or additional information required:**
Additional information is required to evaluate safety significance.
Provide information requested in Item 4.
7. **Internal Review Committee
Signatures:**

H. S. Taylor
Chairman

[Signature]
Mechanical Representative

[Signature]
Structural Representative

L.R. STENSLUND / by C.M. Chippelle
Electrical Representative

[Signature]
Control and Instrumentation
Representative

OBSERVATION REPORT

OR No. 62, Rev. 0, Date 6/7/85

1. Structure(s), system(s), or component(s) involved: (continuation)

BPC Specification 10855-P-202(Q), Revision 10
Piping ISO Drawing 1-P-EG-13, Revision 12
Piping ISO Drawing 1-P-PJ-01, Revision 15

2. Description of Observation: (continuation)

Bechtel Calculation 1(Q) Wall Thickness Calculations for Piping, Rev. 5, (4/15/81) and Rev. 6, (4/23/85) do not appear to include bend allowance in any wall thickness calculations. It appears to calculate wall thickness for only straight pipe and is therefore, the governing calculation for all pipe-straight or bent.

It appears that the Bechtel design process to assure meeting the after bending thickness requirement is to calculate wall thickness for straight pipe and require the pipe fabricator to assure that wall thickness at bends is not less than the values provided by Bechtel as determined by the calculations.

Bechtel Specification 10855-P-201(Q), Rev. 7, (9/13/83) for shop Fabricated Piping, Section 5.7.1, requires that bends shall not have wall thickness below the minimum specified in a tabulation titled, "Minimum Wall for Bends." The tabulation, Rev. 3, includes wall thickness for nominal pipe sizes, (NPS) 3 inch and larger.

Bechtel Specification 10855-P-202(Q), Rev. 10, for Field Fabrication and Installation of Piping, Section 5.2.1.3, states that pipe thickness at the heel of the bends below the values shown in Appendix G are unacceptable. Appendix G includes wall thickness for 2 inch NPS and smaller.

Neither specification appears to cover minimum wall thickness for 2-1/2 inch NPS.

In 10855-P-201(Q), minimum wall thickness of bends for pipes above 14 inch NPS are not provided, where necessary, for some pipe classes, e.g., line 1-EG-HBC-153, (20 inch) is shown on isometric Drawing 1-P-EG-13, Rev. 12, Zone G5 with a bend.

Revision 6 of Calculation 1(Q), Sheet 131 for Class DBB, shows minimum wall thickness greater than the values shown in the P-201 Tabulation, for 10, 12, and 14 inch NPS. Piping Isometric 1-P-BJ-01, Rev. 15, shows Line 1-BJ-DBB-003, (HPCI pump discharge line) with several bends for both the 10 inch and 14 inch segments. (Zones C3, D3, E2, E3, G3, G4 and F5).

Revision 6 of Calculation 1(Q), Sheet 150 for Class HBP, shows minimum wall thickness greater than the values shown in the P-201 Tabulation for NPS, 3 inch through 12 inch.

OBSERVATION REPORT

OR No. 62, Rev. 0, Date 6/7/85

2. Description of Observation: (continuation)

It is therefore, not apparent how correct minimum wall for pipe bends is specified and assured for:

- 2-1/2 inch NPS (not covered in either specification)
- Pipe larger than 14 inch NPS where necessary, (e.g., line 1-EG-HBC-153, 20 inch)
- Pipe for Class DBB, Sizes 10, 12, and 14 (inconsistent between calculation and specification)
- Pipe for Class HBC, sizes 3 inch through 14 (inconsistent between calculation and specification)

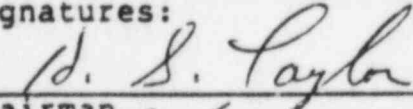
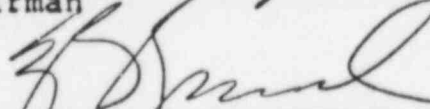
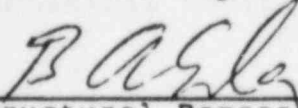
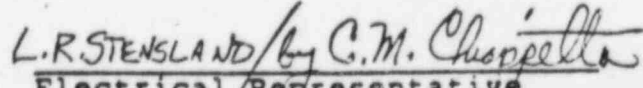
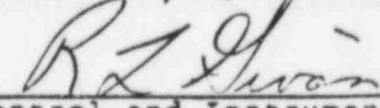
4. Recommendation for Resolution (optional): (continuation)

- a. BPC should provide objective evidence that no 2-1/2 NPS Piping has been designed with bends or if so designed, that minimum wall thickness requirements are met.
- b. BPC should provide wall thickness measurement record for the bend designed for the segment of Line 1-EG-HBC-153.
- c. BPC should provide objective evidence that NPS larger than listed in the P-201 tabulation of "Minimum Wall Thickness for Bends," have not been designed with bends or if so designed, that minimum wall thickness requirements are met.
- d. BPC should provide objective evidence that bends for Pipe Class DBB, Sizes 10, 12, 14, NPS and Class HBC, Sizes 3 through 14 inch, meet the minimum wall thickness documented in Revision 6 of Calculation 1(Q).
- e. BPC should provide assurance that when changes to minimum wall thickness calculations are made with resulting increases in minimum wall thickness, such as was done in Revision 6 of Calculation 1(Q), that design controls exist to incorporate the changes into the appropriate documents, (e.g. fabrication specifications).

OBSERVATION REPORT

OR No. 63, Rev. 0, Date 6/7/85

1. **Structure(s), system(s), or component(s) involved:**
Safety Auxiliary Cooling System
Support Calculation No. 1-P-EG-153-C3, Rev. 2, dated 8/22/84,
Support Drawing No. 1-P-EG-125-H01(Q), Rev. 1, dated 4/27/84,
(continued on next page)
2. **Description of Observation:**
 - a. On Support Drawing No. 1-P-EG-125-H01(Q), Rev. 1, dated 4/27/84, welded beam attachment, rod, hex. nuts, and weldless eye nut were specified for 1-1/8" rod. These
(continued on next page)
3. **Significance of Observation:**
 - a. Size incompatibility of items shown in bill of material on Support Drawing No. 1-P-EG-125-H01(Q), Rev. 1, dated 4/27/84, will make their assembly impossible without a design modification.
(continued on next page)
4. **Recommendation for resolution (optional):**
 - a. The support design should be revised to resolve the apparent discrepancy.
(continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance.
Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

<div style="text-align: center;"> _____ Chairman</div> <div style="text-align: center;"> _____ Mechanical Representative</div> <div style="text-align: center;"> _____ Structural Representative</div>	<div style="text-align: center;"> _____ Electrical Representative</div> <div style="text-align: center;"> _____ Control and Instrumentation Representative</div>
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OBSERVATION REPORT

OR No. 63, Rev. 0, Date 6/7/85

1. Structure(s), system(s), or component(s) involved:

and Support Calculation No. 1-P-EG-125-C1, Rev. 1, dated 4/30/84.
ITT Grinnell Catalogs 76 and 81

2. Description of Observation: (continuation)

items are not compatible with variable support, Item No. 2, on the support drawing, since it is designed to accept a 1" rod size.

- a. For the referenced supports, calculation cover sheets reference ITT Grinnell Catalog 81, whereas, the calculation sheets reference ITT Grinnell Catalog 76.

3. Significance of Observation:

- b. Inconsistent use of catalog reference may lead to inconsistent design.

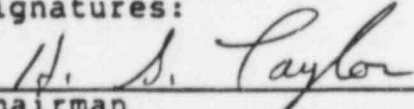
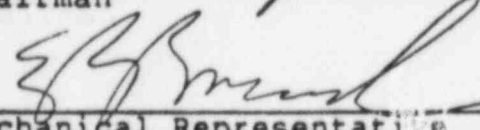
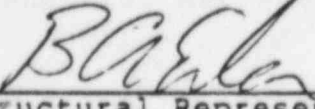
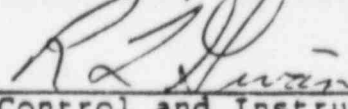
4. Recommendation for Resolution (optional): (continuation)

- b. BPC should identify the cause of the discrepancies, the design process which should have prevented them, and why that process did not prevent the discrepancies.
- c. BPC should provide assurance that similar support designs have correct bill of material specifications.
- d. BPC should assure that all differences between the referenced catalogs are defined and the effect on support hardware compatibility assessed for design impact.

OBSERVATION REPORT

OR No. 64, Rev. 0, Date 6/7/85

1. **Structure(s), system(s), or component(s) involved:**
HPCI Pump Suction and Discharge
Support Drawing No. 1-P-BJ-003-H04(Q), Rev. B, Dated 5/29/84
Clamp Detail Drawing, Figure 40 of LCD sheets, Rev. 3, 1/6/84
SWP/P-5, Rev. 22, FCR/FCN
2. **Description of Observation:**
The 14" riser clamp, Item No. 6, shown on Support Drawing No. 1-P-BJ-003-H04(Q), Rev. 8, dated 5/29/84, is specified with smaller load stud hole dimensions F (hole diameter)
(continued on next page)
3. **Significance of Observation:**
Load stud hole dimensions are smaller than required for corresponding sway strut size. This discrepancy will make the assembly of the clamp to the sway strut impossible without a design modification.
4. **Recommendation for resolution (optional):**
 - a. BPC should revise the support drawings to correct the apparent discrepancy.
(continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

<div style="text-align: center;"> _____ Chairman</div> <div style="text-align: center;"> _____ Mechanical Representative</div> <div style="text-align: center;"> _____ Structural Representative</div>	<div style="text-align: center;"><div style="display: inline-block; vertical-align: middle;">L.R. STENSLAND</div><div style="display: inline-block; vertical-align: middle;">/ by C.M. Chappetta</div> _____ Electrical Representative</div> <div style="text-align: center;"> _____ Control and Instrumentation Representative</div>
---	---

OBSERVATION REPORT

OR No. 64, Rev. 0, Date 6/7/85

2. Description of Observation: (continuation)

and A (distance from edge of clamp to hole center line) than those required by connecting size 1 sway strut and as specified on clamp detailed drawing, Figure 40 of LCDS sheets, Rev. 3, 1/6/84.

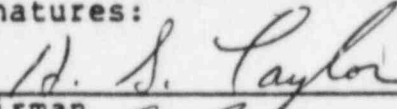

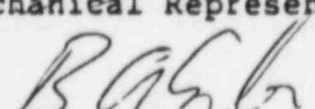
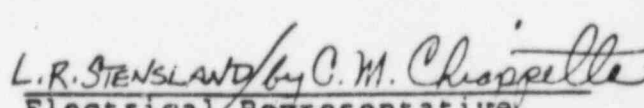

4. Recommendation for Resolution (optional): (continuation)

- b. BPC should provide assurance that similar support designs have correct bill of material specifications.
- c. BPC should identify the cause of the discrepancies, the design process which should have prevented them, and why that process did not prevent the discrepancies.

OBSERVATION REPORT

OR No. 65, Rev. 0, Date 6/7/85

1. **Structure(s), system(s), or component(s) involved:**
Specification 10855-M-707A(Q), Rev. 2
Specification for Hydropneumatic Accumulators
2. **Description of Observation:**
ASME Code Section ND2311 states that the design specification shall state whether impact testing is required, and if it is, the test temperature shall be stipulated. Paragraph 16 of the Design
(continued on next page)
3. **Significance of Observation:**
The ambiguity of the specification leaves the determination of the need for impact testing and the test temperature up to the discretion of the contractor.
4. **Recommendation for resolution (optional):**
 - a. BPC should revise the specification to state whether or not impact testing is required and if so, should specify the test temperature.
(continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

<div style="text-align: center;"> _____ Chairman</div> <div style="text-align: center;"> _____ Mechanical Representative</div> <div style="text-align: center;"> _____ Structural Representative</div>	<div style="text-align: center;"> _____ Electrical Representative</div> <div style="text-align: center;"> _____ Control and Instrumentation Representative</div>
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OBSERVATION REPORT

OR No. 65, Rev. 0, Date 6/7/85

2. Description of Observation: (continuation)

Specification states that impact testing shall be applied as applicable in accordance with Paragraph ND2311 of the code. No test temperature is stated. Additionally, the documentation requirements transmitted to the vendor in Form G-321-D do not require the vendor to submit Impact Test Data Reports.

4. Recommendation for Resolution (optional): (continuation)

- b. BPC should provide assurance that the subject accumulators meet the stated requirements.
- c. BPC should identify the cause of the discrepancies, the design process which should have prevented them, and why that process did not prevent the discrepancies.

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ASSOCIATE
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~~P. J. Taylor~~
~~W. J. Taylor~~ PDR
LSP-52
June 7, 1985
Project No. 7212-30

Public Service Electric and Gas Company
Hope Creek Generating Station - Unit 1

Independent Design Verification Program
Observation Reports

Mr. W. F. Bauer
Principal Engineer
Public Service Electric and Gas Company
80 Park Plaza
Newark, New Jersey 07101

Dear Mr. Bauer:

Enclosed for your information and action is one copy each of
Observation Reports Nos. 66 through 72 resulting from the IDVP
of the Hope Creek Generating Station.

The Observation Reports should be reviewed and the Resolution Report
sheets completed and signed by Bechtel and PSE&GC and returned as
soon as possible. Return of original documents should be via Federal
Express or equivalent overnight service in order to facilitate S&L's
disposition of the Observation Reports.

Any questions you or Bechtel may have concerning these Observation
Reports should be addressed in accordance with the Program Plan
Protocol.

Yours very truly,

H. S. Taylor

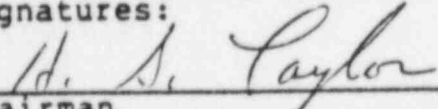
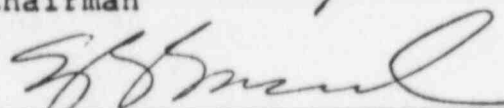
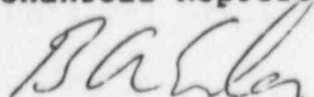
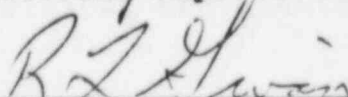
H. S. Taylor
Chairman, Internal Review Committee

HST:nd
Enclosures
Copies:
T. Delgaizo
J. L. Milhoan
L. C. Oesterich
P. L. Wattelet
W. A. Bloss (2)
O. Zaben
W. D. Crumpacker
T. J. Duffy
H. G. L. McCullough
R. M. Schiavoni
D. P. White

OBSERVATION REPORT

OR No. 66, Rev. 0, Date 6/7/85

1. **Structure(s), system(s), or component(s) involved:**
Hydropneumatic Accumulators
Design Specification 10855-M-707A(Q), Rev. 2
2. **Description of Observation:**
Design Loading Combinations are given in HCGS FSAR, Table 3.9-8.
Loading combinations contained in the above noted Design Specification do not meet this licensing commitment.
Specifically: (continued on next page)
3. **Significance of Observation:**
Adequacy of Component Stress Analysis cannot be determined for FSAR loading combinations.
4. **Recommendation for resolution (optional):**
 - a. BPC should provide specific information as to how the observation has or will be corrected.
(continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance.
Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

<div style="text-align: center;"> _____ Chairman</div> <div style="text-align: center;"> _____ Mechanical Representative</div> <div style="text-align: center;"> _____ Structural Representative</div>	<div style="text-align: center;"><div style="display: inline-block; vertical-align: middle;">L.R. STENSLAND</div> / <div style="display: inline-block; vertical-align: middle;">by C. M. Chappella</div> _____ Electrical Representative</div> <div style="text-align: center;"> _____ Control and Instrumentation Representative</div>
---	--

OBSERVATION REPORT

OR No. 66, Rev. 0, Date 6/7/85

2. Description of Observation: (continuation)

- a. No Emergency Loading Combination was required.
- b. For the normal loading combination "P" (Design Pressure) should have been used rather than "OP" (Operating Pressure).
- c. The "FV" (Valve Closure Transient) component in loading has not been addressed as required in 10855-D3.10, Rev. 2, paragraph 1.3.3.

4. Recommendation for Resolution (optional): (continuation)

- b. BPC should identify the causes of the discrepancies, the design process which should have prevented them, and why that process did not prevent the discrepancies.
- c. BPC should describe the process that is used to ensure that FSAR commitments are incorporated into the design.
- d. BPC should provide assurance that the subject accumulators meet the stated FSAR requirements.

OBSERVATION REPORT

OR No. 67, Rev. 0, Date 6/7/85

1. **Structure(s), system(s), or component(s) involved:**
SACS System Logic and Schematics
Logic Diagram J-11-0, Sheet 4, Rev. 6, dated 10/17/84
Schematic Diagram E-0217-0, Sheet 2, Rev. 2, dated 7/12/84
2. **Description of Observation:**
EDP 4.46 requires that design drawings issued for construction and given a numerical revision number be approved by the project manager. (continued on next page)
3. **Significance of Observation:**
It appears that the project team is not following the required EDPs and therefore, design released for construction may not have received the proper authorization.
4. **Recommendation for resolution (optional):**
BPC should provide justification for the lack of approval of these drawings in accordance with EDP 4.46.
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

H. S. Taylor
Chairman

[Signature]
Mechanical Representative

[Signature]
Structural Representative

L.R. STENSLAND / by C.W. Chappella
Electrical Representative

[Signature]
Control and Instrumentation Representative

OBSERVATION REPORT

OR No. 67, Rev. 0, Date 6/7/85

2. Description of Observation: (continuation)

Contrary to this requirement, the SACS logic diagrams and schematics were issued without the required signature. BPC has not provided procedures or documentation which alters this requirement for the HCGS project.

OBSERVATION REPORT

OR No. 68, Rev. 0, Date 6/7/85

1. **Structure(s), system(s), or component(s) involved:**

ADS System, Safety Relief Valve Instrumentation
P&ID M-41-1, Sheet 1, Rev. 10, dated 3/7/85 and P&ID M-41-1,
Sheet 2, Rev. 9, dated 3/14/85

2. **Description of Observation:**

P&ID M-41-1, Sheet 1, and M-41-1, Sheet 2, do not provide the
references to the GE ADS Elementary Diagrams. Instead, P&IDs
refer only to GE Functional Control Diagrams.

3. **Significance of Observation:**

BPC informed the review team at the kick-off meeting that GE
FCD's are not up-to-date and should not be used. References
to GE Elementary Diagrams should be shown on P&IDs. Lack of
proper references could cause discrepancies in the design.

4. **Recommendation for resolution (optional):**

- a. BPC should revise the P&IDs to show the correct GE
Elementary Diagram Reference.

(continued on next page)

5. **Internal Review Committee classification of Observation:**

____ Not significant to safety (See Item 6)
 x Additional information required (See Item 6)
____ Potentially Significant to Safety (See Item 8)

6. **Internal Review Committee reason for non-safety-significance of
Observation or additional information required:**

Additional information is required to evaluate safety significance.
Provide information requested in Item 4.

7. **Internal Review Committee
Signatures:**

H. S. Taylor
Chairman

[Signature]
Mechanical Representative

[Signature]
Structural Representative

L.R. STENSLAND / by C.W. Chappelle
Electrical Representative

[Signature]
Control and Instrumentation
Representative

OBSERVATION REPORT

OR No. 68, Rev. 0, Date 6/7/85

4. Recommendation for Resolution (optional): (continuation)
- b. BPC should provide assurance that the potentially discrepant information was not implemented in the design.
 - c. BPC should provide assurance that no other P&IDs reference the GE Functional Control Diagrams and that if the references have been made, provide assurance that the potentially discrepant information has not been implemented in the design.
 - d. If the GE Functional Control Diagrams are no longer applicable as design input for the project, BPC should provide the method utilized to appraise the project of the non-applicability.

OBSERVATION REPORT

OR No. 69, Rev. 0, Date: 6/7/85

1. **Structure(s), system(s), or component(s) involved:**
Safety Auxiliary System Heat Exchanger
Design Specification 10855-M-069(Q), Rev. 12
DITS 3.10, Rev. 2
2. **Description of Observation:**
Load combinations given in Paragraph 8.2 of the Design Specification do not agree with the load tables in the FSAR 3.9-8, for components or 3.9-21 for component supports. The
(continued on next page)
3. **Significance of Observation:**
Adequacy of component analysis cannot be determined for FSAR loading combinations.
4. **Recommendation for resolution (optional):**
a. BPC should provide specific information as to how the observation has or will be corrected.
(continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

H. S. Taylor
Chairman

[Signature]
Mechanical Representative

[Signature]
Structural Representative

L. R. STENSLAND / by C. M. Chappella
Electrical Representative

[Signature]
Control and Instrumentation Representative

OBSERVATION REPORT

OR No. 69, Rev. 0, Date 6/7/85

2. Description of Observation: (continuation)

upset condition does not contain a "FV" (Valve Closure Transient) component and the emergency combination does not address "FV" and "OBE." "FV" is required by 10855-D3.10, Rev. 2, Paragraph 1.3.3.

4. Recommendation for Resolution (optional): (continuation)

- b. BPC should provide assurance that other equipment design specification loading combinations are consistent with the FSAR.
- c. BPC should describe the process that is used to ensure that FSAR commitments are incorporated into the design.
- d. BPC should provide assurance that the subject heat exchanger meets the stated FSAR requirements.

OBSERVATION REPORT

OR No. 70, Rev. 0, Date 6/7/85

1. **Structure(s), system(s), or component(s) involved:**
Design Specification 10855-M-069(Q), Rev. 3, SACS Heat Exchangers
Design Specification 10855-M-070(Q), Rev. 10, SACS System Pumps
2. **Description of Observation:**
HCGS FSAR Table 3.11-1a and 3.11-2 gives the enveloping and maximum plant environmental conditions for the SACS pump and heat exchanger rooms. The values for ambient temperature and LOCA integrated
(continued on next page)
3. **Significance of Observation:**
Adequacy of the component design cannot be determined for FSAR commitments for environmental conditions.
4. **Recommendation for resolution (optional):**
a. BPC should provide specific information as to how the observation will be corrected. (continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.

7. **Internal Review Committee Signatures:**

H. L. Taylor
Chairman

[Signature]
Mechanical Representative

[Signature]
Structural Representative

L.R. STENSLAND / by C.M. Chappetta
Electrical Representative

[Signature]
Control and Instrumentation Representative

OBSERVATION REPORT

OR No. 70, Rev. 0, Date 6/7/85

2. Description of Observation: (continuation)

dose included in the subject design specifications do not agree with the FSAR tables, (i.e., the design specifications show an ambient temperature of 60°-104°F; also, the DBE temperature of 340°F for 30 minutes and the 148°F for the duration of the DBE do not appear in the design specification).

4. Recommendation for Resolution (optional): (continuation)

- b. BPC should describe the process that is used to ensure that FSAR commitments are incorporated into the design.
- c. BPC should provide assurance that the subject heat exchangers and pumps meet the stated FSAR requirements.

OBSERVATION REPORT

OR No. 71, Rev. 0, Date 6/7/85

1. **Structure(s), system(s), or component(s) involved:**
Safety Auxiliaries Cooling System Pumps
Design Specification 10855-M-070(Q), Rev. 3
2. **Description of Observation:**
HCGS FSAR commits to design loading combinations for ASME B&PV code Class 1, 2 and 3 Non-NSSS components. The design load combinations given in Specification 10855-M-070(Q), Rev. 3,
(continued on next page)
3. **Significance of Observation:**
Adequacy of component stress analysis cannot be determined for FSAR load combinations.
4. **Recommendation for resolution (optional):**
a. BPC should provide specific information as to how the observation has or will be corrected.
(continued on next page)
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

<u>H. S. Taylor</u> Chairman	<u>L.R. STENSLAND / by C.M. Chappetta</u> Electrical Representative
<u>[Signature]</u> Mechanical Representative	<u>R. L. Lwin</u> Control and Instrumentation Representative
<u>[Signature]</u> Structural Representative	

OBSERVATION REPORT

OR No. 71, Rev. 0, Date 6/7/85

2. Description of Observation: (continuation)

differ from those given in the FSAR. "FV" (Valve Closure Transient) loads were eliminated from the upset combination and the $(OBE^2 + FV^2)^{1/2}$ term was removed from the emergency combination.

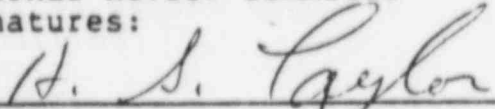
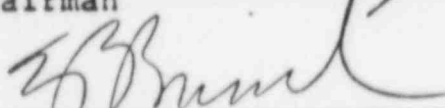
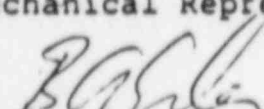
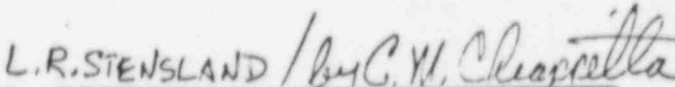

4. Recommendation for Resolution (optional): (continuation)

- b. BPC should describe the process that is used to ensure that FSAR commitments are incorporated into the design.
- c. BPC should provide assurance that the subject pumps meet the stated FSAR requirements.

OBSERVATION REPORT

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1. **Structure(s), system(s), or component(s) involved:**
Safety-related structures, systems and components subjected to consequences of high energy pipe break.
DITS 10855-D7.3, Rev. 1, (4/2/84)
2. **Description of Observation:**
FSAR Section 3.6.1.3 reads in part:
"Special consideration has been given to separation of areas in the reactor building containing essential systems and
(continued on next page)
3. **Significance of Observation:**
This observation indicates that the licensing commitment for HELB/MELB effect confinement may not have been met.
4. **Recommendation for resolution (optional):**
BPC should provide an analysis confirming that the penetrations through the wall are designed steam-tight for the postulated line break conditions.
5. **Internal Review Committee classification of Observation:**
☐ Not significant to safety (See Item 6)
☒ Additional information required (See Item 6)
☐ Potentially Significant to Safety (See Item 8)
6. **Internal Review Committee reason for non-safety-significance of Observation or additional information required:**
Additional information is required to evaluate safety significance. Provide information requested in Item 4.
7. **Internal Review Committee Signatures:**

<div style="text-align: center;"> _____ Chairman</div> <div style="text-align: center;"> _____ Mechanical Representative</div> <div style="text-align: center;"> _____ Structural Representative</div>	<div style="text-align: center;"><div style="display: flex; justify-content: space-between;">L.R. STENSLAND/ by C. H. Chiappetta</div> _____ Electrical Representative</div> <div style="text-align: center;"> _____ Control and Instrumentation Representative</div>
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OBSERVATION REPORT

OR No. 72, Rev. 0, Date 6/7/85

2. Description of Observation: (continuation)

components from high energy pipe break compartments and the effects of postulated pipe ruptures. HVAC ducts penetrating high energy pipe break compartment walls are equipped with backpressure dampers, while other types of penetrations through the walls are designed as steam-tight."

The pipe break confinement has apparently been considered in the Separation Review Meetings (per D7.3) and the consideration documented in Item II.A.6 of the Separation Review Data Sheets (D7.3, App. E). The SRDS intended as documentation for the analysis required by the FSAR, alone do not adequately document compliance with the above licensing commitment (i.e. specific calculations for penetrations for Rooms 4111, 4307 and 4316 are not available).