

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

ACCESSION NBR: 8503280539 DOC. DATE: 85/03/22 NOTARIZED: NO DOCKET #
 FACIL: 50-410 Nine Mile Point Nuclear Station, Unit 2, Niagara Moho 05000410
 AUTH. NAME: MANGAN, C.V. AUTHOR AFFILIATION: Niagara Mohawk Power Corp.
 RECIP. NAME: SCHWENCER, A. RECIPIENT AFFILIATION: Licensing Branch 2

SUBJECT: Forwards Vols 1 & 2 of S&W "Rept of Findings of Independent Review of Key Technical, Interface & Const Concerns," per 850315 agreement. Audit plans also encl.

DISTRIBUTION CODE: B001D COPIES RECEIVED: LTR 1 ENCL 1 SIZE: 111 + 181
 TITLE: Licensing Submittal: PSAR/FSAR Amdts & Related Correspondence

NOTES:

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NRR LB2 LA		1	0	HAUGHEY, M	01	1	1
INTERNAL: ACRS	41	6	0	ADM/LFMB		1	0
ELD/HDS3		1	0	IE FILE		1	0
IE/DEPER/EPB	36	1	1	IE/DQAVT/QAB21		1	0
NRR ROE, M.L		1	1	NRR/DE/AEAB		1	0
NRR/DE/CEB	11	1	1	NRR/DE/EHEB		1	0
NRR/DE/eqb	13	2	2	NRR/DE/GB	28	2	2
NRR/DE/MEB	18	1	1	NRR/DE/MTEB	17	1	1
NRR/DE/SAB	24	1	1	NRR/DE/SGEB	25	1	1
NRR/DHFS/HFEB40		1	1	NRR/DHFS/LQB	32	1	1
NRR/DHFS/PSRB		1	1	NRR/DL/SSPB		1	0
NRR/DSI/AEB	26	1	1	NRR/DSI/ASB		1	0
NRR/DSI/CPB	10	1	1	NRR/DSI/CSB	09	1	1
NRR/DSI/ICSB	16	1	1	NRR/DSI/METB	12	1	1
NRR/DSI/PSB	19	1	1	NRR/DSI/RAB	22	1	1
NRR/DSI/RSB	23	1	1	REG FILE	04	1	1
RGN1		3	0	RM/DDAMI/MIB		1	0
EXTERNAL: BNL (AMDTs ONLY)		1	0	DMB/DSS (AMDTs)		1	0
LPDR	03	1	1	NRC PDR	02	1	1
NSIC	05	1	1	PNL GRUEL, R		1	0

Limited Dist.

March 22, 1985
(NMP2L 0371)

Mr. A. Schwencer, Chief
Licensing Branch No. 2
Division of Licensing
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Schwencer:

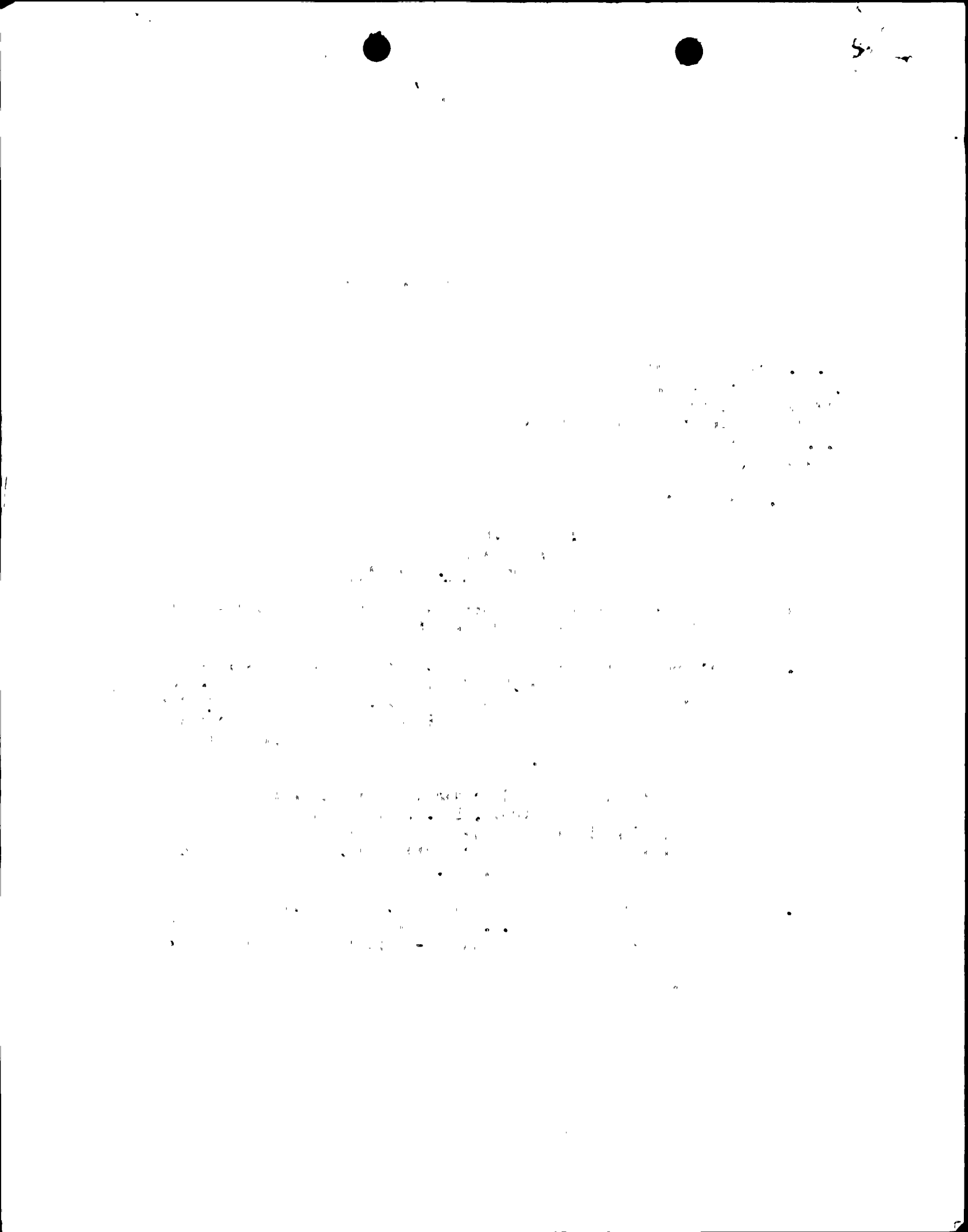
Re: Nine Mile Point Unit 2
In-Depth Technical Audit
Docket No. 50-410

Niagara Mohawk is providing the following material as we agreed during our meeting at the Region I office on March 15, 1985.

1. "Report of Findings of Independent Review of Key Technical Interface and Construction Concerns," May 13, 1983, Volumes I and II. This report is the result of the SWEC New York Operations Center review of the Nine Mile 2 project and specifically provides information relating to the review of the AC power systems which was performed as part of that evaluation.
2. SWEC Quality Assurance audit reports and audit plans for audits performed of Reactor Controls, Inc. in August 1983, January 1984 and July 1984. This information should provide your staff with additional background for their evaluation concerning the technical auditing of Reactor Controls, Inc.
3. In order to provide additional information relating to Reactor Controls, the SWEC draft Q.A. audit plan for the upcoming audit of Reactor Controls relating to the as-built reconciliation activities on Nine Mile Point Unit 2 control rod drive piping system is also included.

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Nuclear Regulatory Commission

Page 2

March 22, 1985

We believe that your review of the above information will provide you with sufficient bases regarding our decision not to include an AC power system or Reactor Controls as part of our upcoming Engineering Assurance technical audit and associated Quality Assurance audit. Regarding those audits, the plan for implementation of the coordinated reviews, as well as additional information relating to surveillance programs being applied on Reactor Controls' hardware installation on site, will be provided in subsequent correspondence.

Very truly yours,



C. V. Mangan
Vice President

Nuclear Engineering & Licensing

CDT:ja

Enclosure

xc: R. A. Gramm, NRC Resident Inspector (w/enclosure)

J. Milhoan (w/enclosure)

Project File (2)

**REPORT OF FINDINGS
OF
INDEPENDENT REVIEW OF
KEY TECHNICAL, INTERFACE AND
CONSTRUCTION CONCERNS**

**NINE MILE POINT NUCLEAR STATION — UNIT 2
NIAGARA MOHAWK POWER CORPORATION**

VOLUME II

Prepared by

**STONE & WEBSTER ENGINEERING CORPORATION
NEW YORK OFFICE**

J.O. NO. 12177.73

May 13, 1983

8503280539

STONE & WEBSTER





Stone & Webster Engineering Corporation
Niagara Mohawk Power Corporation
Nine Mile Point Nuclear Station - Unit 2
Independent Design Review Program

RPP-2-0
J.O.No. 12177.73

CONSTRUCTIBILITY REVIEW FINDING

Task No./Description: No. 4 - Clarity and Completeness
of Drawings

Sheet 1 of 2

1. Items of concern/Item under review:

- a. Clarity of drawings
- b. Completeness of drawings

2. Source of information, persons contacted, background on subject matter:

Same as Task No. 2.

Near the end of 1982, contractors expressed some concern over clarity and completeness of drawings. Much of their concern was directed at BZ (supports) drawings. The EM Division subsequently reissued its procedure for checking drawings, which provided a revised checklist. Also, groups of 500 BZs were given a second review, some in CHOC, some by the SEG.

3. Finding:

- a. CLARITY--Amount of information on EK drawings make them "busy;" thus, half-size prints are difficult to use. No other significant drawing clarity concerns were identified.
- b. COMPLETENESS--BZ drawings have apparently improved since implementation of the revised designers' checklist.

EK drawings (Category I) lack some information or have incorrect information, e.g., EK-401B (missing dimension, dimensions do not add up, section does not match plan).

DP drawings (Category I) do not provide hanger locations relative to building lines; rather, only to pipe or tube runs. Hangers then cannot be located without pipe being in place.

Originated by

F. J. Young
Signature

5-11-83
Date

Review/Concurrence

C. E. Goodman
Construction Manager

C2/1217773/8/2RH





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4. Evaluation of potential impact, conclusions:

Earlier concerns by contractors appear to have been largely addressed. New concerns, primarily expressed by the I&C contractor, are attributed in part to his just getting started in the Category I/seismic (preengineered) areas. Improvement in the quality of Category I EK drawings is expected as contractor concerns get fed back through design.

While wiring diagrams, flow diagrams, test loop diagrams, and loop calibration reports were not considered, it is concluded that drawing clarity and completeness of all other drawings are adequate to maintain the present schedule for construction completion and start-up.

C2/1217773/8/2RH



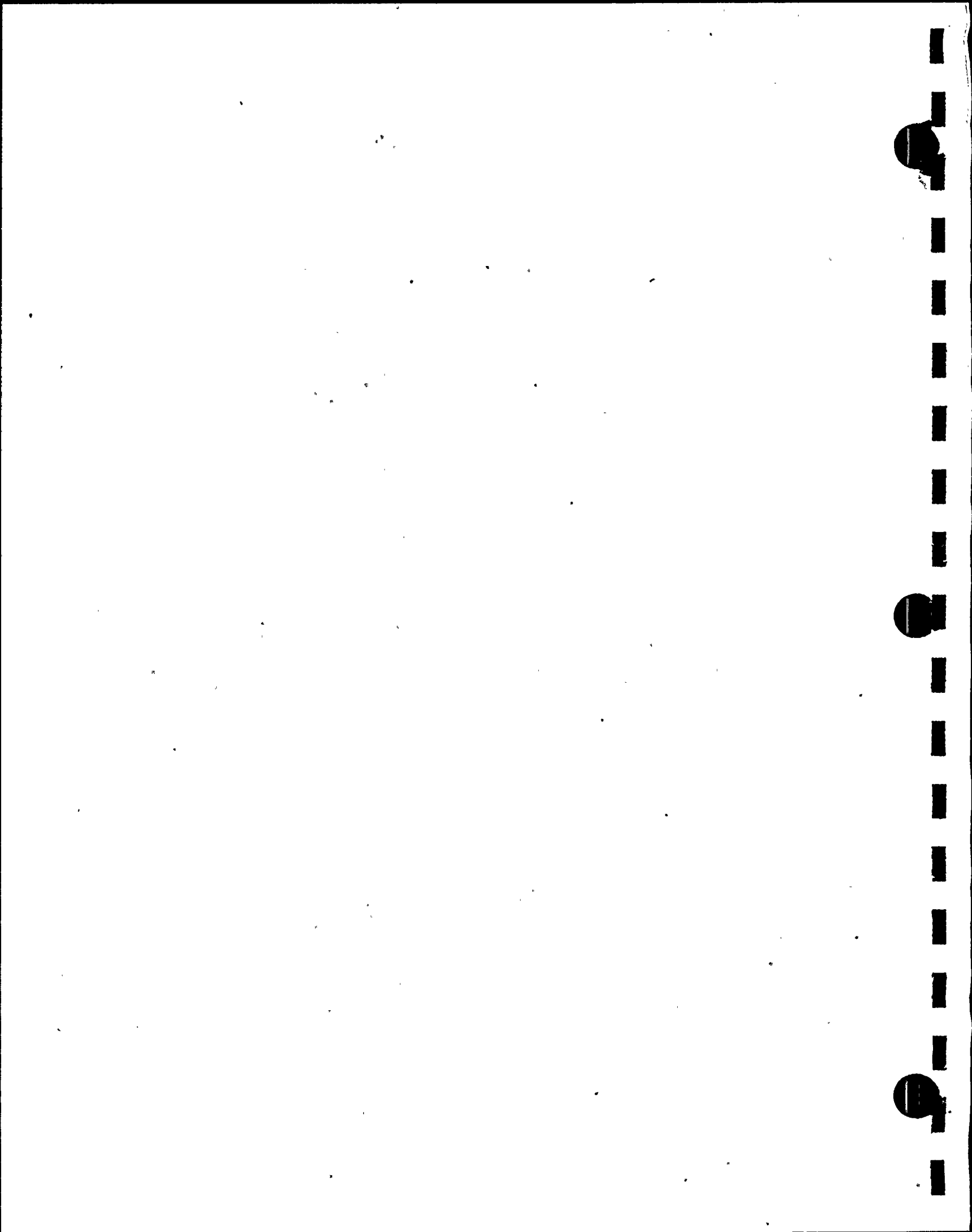


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VOLUME II

RPP-1	Design Review Procedure for Systems and Interdiscipline Communication
RPP-2	Review Procedure for Constructibility
RPP-3	Review Plan Scope of Work
RPP-4	Cancelled
RPP-5	Project Files





J.O. NO. 12177.73
STONE & WEBSTER ENGINEERING CORPORATION
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT NUCLEAR STATION - UNIT 2
INDEPENDENT DESIGN REVIEW PROGRAM

REVIEW PROJECT PROCEDURE RPP-1-2
Date: March 17, 1983
Revised: March 24, 1983
Revised: May 5, 1983
Page 1 of 10

DESIGN REVIEW PROCEDURE FOR SYSTEMS
AND INTERDISCIPLINE COMMUNICATION

Albert A. Patterson
Review Project Engineer

May 6, 1983
Date

1.0 PURPOSE

- 1.1 This procedure implements, documents and controls the independent design review with respect to the evaluation criteria, performance and results of the following areas (see Flow Chart, Attachment 12):
- . Service Water System
 - .. Onsite Emergency AC Power System
 - . Interdiscipline Communication
- 1.2 This procedure provides the necessary forms and instructions to assemble all the review results for tasks identified in each disciplines' Job Book.
- 1.3. For the independent review of constructibility concerns, see Review Project Procedure RPP-2.

2.0 SCOPE

2.1 Independent System Design Review

- 2.1.1 Service Water System Review will include a multi-discipline design review to ensure performance of its required functions.
- 2.1.2 Onsite Emergency AC Power System will be reviewed to ensure performance of its required functions.
- 2.1.3 The Interdiscipline Communication Review will determine that the proper flow of design information and normal communication exists between all engineering disciplines, design functions, vendor facilities and construction forces as well as the incorporation of all scope changes.



3.0 CRITERIA

3.1 Design Assumption Review

3.1.1 Verification of System Design Input

- a) Review the evolution of the system design inputs and scope changes to ensure they have been incorporated.
- b) Determine whether documents have been revised in a timely and properly sequenced manner, to indicate the latest status of design, procurement and construction.

3.1.2 Design adequacy for compliance with commitments to the appropriate design criteria and licensing requirements.

3.1.3 Specific safety-related functions will be accomplished as intended.

3.1.4 Procurement specifications utilize the appropriate technical design criteria.

3.1.5 System interfaces will be reviewed to the extent that they have an impact on the system under review.

3.1.6 New analytical techniques or calculations will not be considered unless a questionable approach or inconsistent result is uncovered during the review.

3.2 Equipment Qualification Program

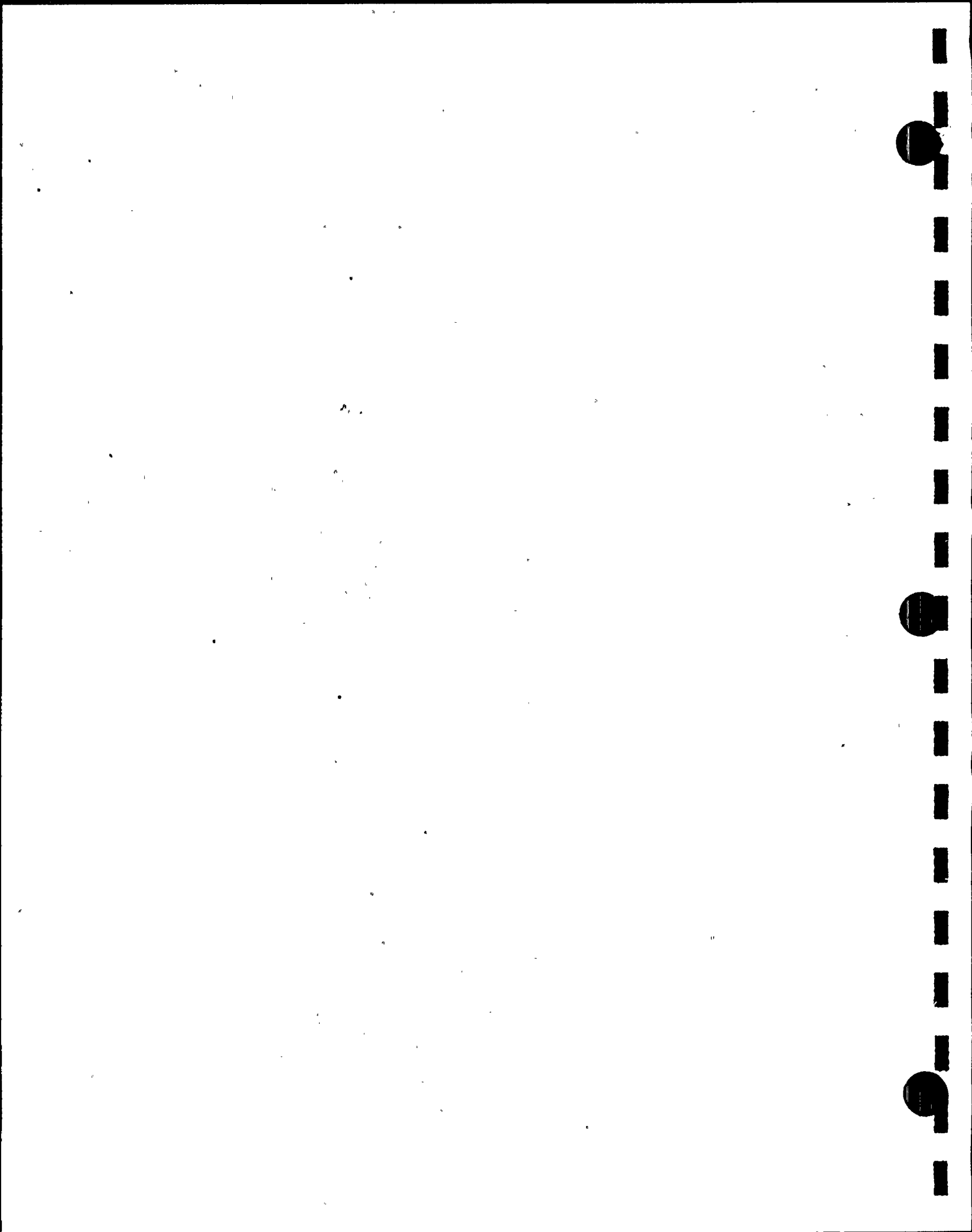
Review criteria used in establishing the qualification status of the safety-related equipment. This will include the basis for specifying the environmental parameters, operating time and equipment selection.

Determine that the electrical cables and equipment, and mechanical equipment comply with the required environmental parameters, including the seismic and hydrodynamic loads.

Investigate the project program requirements, including scope of documentation, and determine if program requirements are being followed.

3.3 Post TMI Requirements

Post TMI requirements of NUREG-0737 will be reviewed for compliance where direct impact on the system design occurs.



3.4 Single Failure Criteria Review

Assess systems to confirm that the design incorporates single failure criteria for mechanical, electrical and control components. Determine if Failure Modes and Effects Analyses (FMEA) have been adequately performed to ensure proper operation and that the required redundancy exists.

3.5 Interdiscipline Communication Review

3.5.1 Assess the plant systems, documents, and administrative procedures to ensure that the current design has been updated for all changes (Design and Licensing) within each discipline. Areas of concentration will include document and calculation completeness, design consistency, and design change implementation. This review will be based on the specific two system design reviews as defined in Sections 3.1 through 3.4. Compliance will be verified as part of the two system reviews and by sampling selected areas of other fluid and/or nonfluid systems. The sampling will be of sufficient depth to provide a meaningful conclusion, representative of the entire project.

4.0 PROCEDURE

4.1 Obtaining Verification Data and Documentation

4.1.1 The Lead Engineer responsible for verifying a design effort or reviewing the flow of interdiscipline information shall identify and obtain from the NMP-2 Project all the documentation required.

4.1.2 All documents obtained from the NMP-2 Project shall be controlled according to Section 5.0, Document Control..

4.2 Identifying Licensing Commitments and Documents

4.2.1 The responsible engineer shall review the FSAR and determine which documents are pertinent to the task being reviewed. These licensing documents shall be identified on Attachment 1. Attachment 1 shall be signed and dated by the responsible engineer and approved by the Lead Engineer.

4.2.2 Using the documents listed in Attachment 1, the responsible engineer shall identify those licensing commitments and other design commitments establishing design requirements for the specific areas of review. These licensing commitments shall be listed by the responsible engineer according to Attachment 2. Attachment 2 shall be signed and dated by the respon-



sible engineer and approved by the responsible Lead Engineer.

- 4.2.3 The Interdiscipline Communication Review will concentrate on the flow of engineering information and incorporation of scope changes into the development of the system design. The documents, procedures, and specific commitments (Attachment 2) identified in the system reviews will provide the basis of this review. As a means of verifying that the flow of information between disciplines has occurred, the NMP-2 Project Procedure pertaining to this subject will be used as the benchmark.

4.3 Review Method

- 4.3.1 The responsible engineer shall consider the licensing and other design commitments in Attachment 2 when determining which parameters/characteristics best represent the areas selected for review of a given task.
- 4.3.2 Review Project Procedure RPP-3, Review Plan Scope of Work, outlines the task breakdown for each discipline. This scope listing may include descriptions of certain subject categories rather than specific tasks. From these descriptions, specific tasks will be identified. Additional tasks may be specified as the review progresses.
- 4.3.3 The Lead Engineer shall identify the specific tasks and assign a sequential identification number from the appropriate disciplines' Job Book Master Task Number List, Procedure RPP-5.
- 4.3.4 Identify and assess these parameters/characteristics in Attachments 3 and/or 4.
- 4.3.5 Attachments 3 and 4 are Review Plans designed to organize, control, and document activities for specific reviews/analyses of the engineering for a given task.
- a. These Review Plans shall be used by the responsible engineer to document the review of the specific parameters/characteristics.
 - b. The responsible engineer shall summarize the review for a given task by completing, signing, and dating a Task Review Summary (Attachment 6). The Lead Engineer shall review, sign, and date each Task Review Summary.



- c. The Lead Engineers shall summarize the reviews for a given discipline in each system that they are responsible for verifying, by completing, signing, and dating a System Summary Sheet (Attachment 7).
- d. The Review Plans and Task Review Summaries will provide the input to the System Summary Sheets. All summary sheets shall be filed according to paragraph 6.0 of this procedure. The System Summary Sheets are input to the single review summary (Attachment 8) for the complete system.

4.3.6 The responsible engineer shall consider the applicable design and licensing requirements and determine which of the review methods (for calculations or documents) listed in Attachment 3 or 4 best meets the needs of the review process.

4.3.7 The method for reviewing the calculations or the purpose for reviewing the document shall be identified in the spaces provided on Attachment 3 or 4 respectively.

4.3.8 Attachment 4 will be used to address interdisciplinary communication concerns. These forms will be uniquely identified by preceding the discipline identification number with an "I". Refer to Task Force clarification memorandums when using Attachment 4, Item IV-B.

4.3.9 Sources of input information and design criteria will be reviewed to ensure that they are final and up to date. Documents will be reviewed for consistency and incorporation of all approved information. Engineering changes that developed will be reviewed for effects on revisions to the system design in each discipline.

4.3.10 Changes will be monitored by reviewing the implementation of NMP2 project procedures, holds on drawings, revision changes to documents, licensing commitment changes, field changes described by E&DCRs, vendor equipment changes, and Engineering Change Notices.

4.3.11 Detailed instructions to complete these Review Plans are contained in Attachment 3 and 4.

4.3.12 When a review results in issue of an Open Item Report (Attachment 5, see Section 5.0, Reporting), the open item number from the report shall be identified in the space provided on Attachments 3 and/or 4 and/or 5.



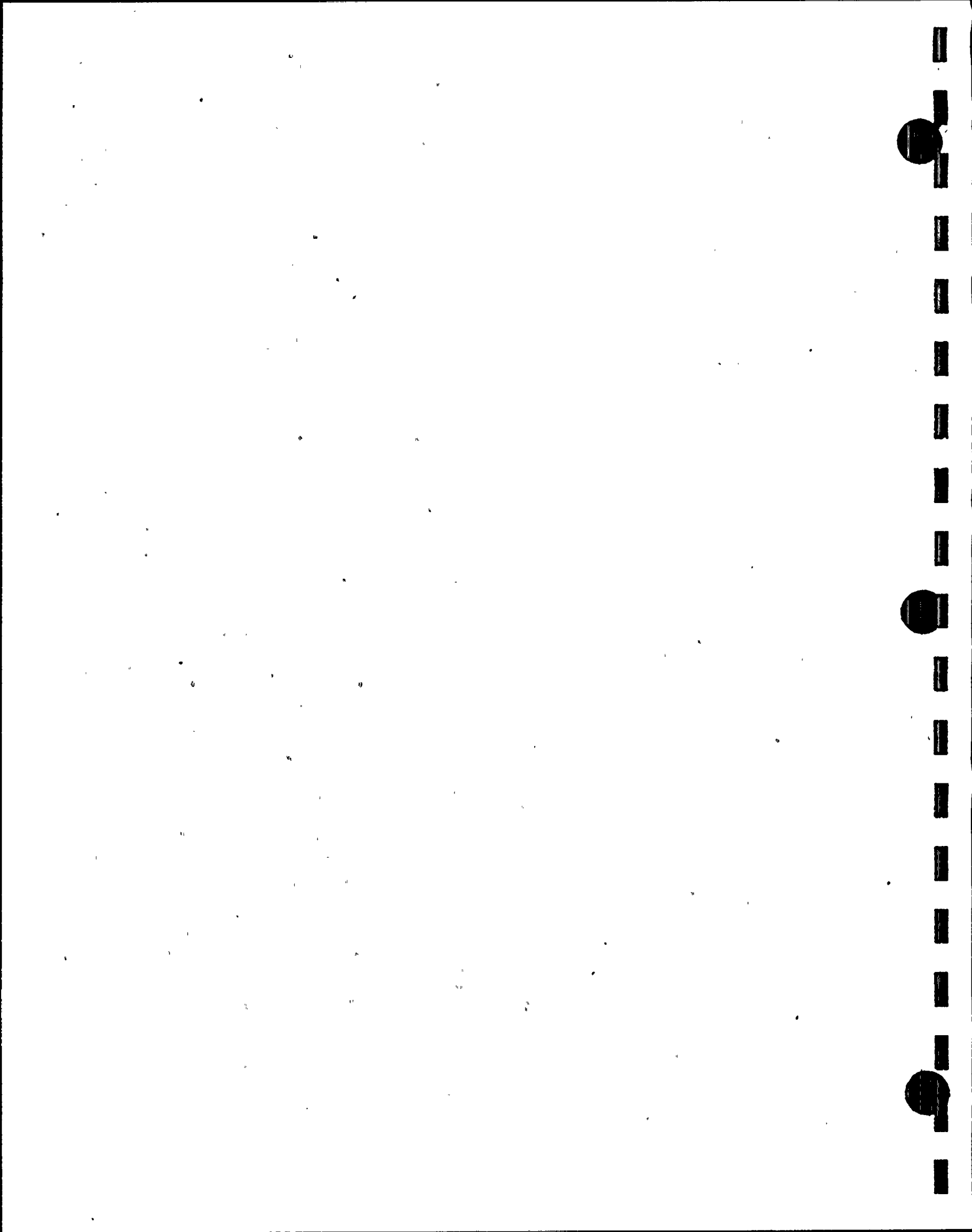


- 4.3.13 The responsible engineer shall complete the Task Review Summary by recording the task title, stating the task objective, checking the appropriate conclusion box and noting any comments pertinent to the conclusion of the task review.
- 4.3.14 Upon completion of all reviews scheduled to be performed for a system the Lead Power Engineer (or the Lead Electrical Engineer for the Electrical System) shall assemble all of the original System Summary Sheets for that system from the appropriate disciplines and attach them behind a System Review Summary cover sheet (Attachment 8).
- 4.3.15 The Project Engineer shall review the summaries and indicate the results of the review for that system by marking the appropriate box, signing and dating the review Summary cover sheet.

5.0 REPORTING

- 5.1 The Lead Engineer responsible for the review of a given design effort in his discipline shall itemize and report the review/analysis results using the Design Review Packages defined in Section 6.1 as input.
 - 5.1.1 The results of the review for specific task are summarized in the Task Review Summary. Systems are summarized for a given discipline by the Lead Engineer in the System Summary. These summaries are used to maintain the information required by the reports identified in this section.
- 5.2 Reports will be prepared to provide visibility of progress, to furnish information between disciplines and to summarize potential discrepancy items.
 - 5.2.1 Biweekly status meetings will be held to present current progress, significant issues and manpower and dollar expenditures to NMPC. The task force and management reviews shall be accomplished prior to the weekly meeting. Items that are not fully reviewed by the task force will be discussed at the next biweekly meeting. Meeting notes will be issued immediately. They shall be written as summary notes, with support information and clarifications furnished by the appropriate attachments.
 - 5.2.2 Open Item Reports
 - a. These reports are prepared by the responsible engineer using Attachment 5, for the purpose of reporting an apparent inconsistency. The basis





for the Open Item Report shall be documented in a Design Review Package.

- b. Open Item Reports shall be identified by a file number assigned sequentially from the next available number starting with 001.
- c. The completed Open Item Report shall be reviewed and approved by each Lead Engineer, the Review Project Engineer, and the Engineering Management sponsor.
- d. The Review Project Engineer shall review with NMPC at the biweekly progress meeting all Open Item Reports after each has been completely reviewed and approved.

5.2.3 Potential Discrepancy Reports

After an open item report has been discussed with NMPC and the NMP2 project (usually at the biweekly progress meeting) and is found to remain open, it is identified as a potential discrepancy and reported on the Potential Discrepancy Report form, Attachment 9. All potential discrepancy reports shall be transmitted to NMPC with an explanation letter.

5.2.4 Final Report

- a. Each Lead Engineer having input to any Open Item Report, or Potential Discrepancy Report, identified during the review shall maintain complete documentation filed within the Job Books.
- b. Upon completion of the system reviews, the initial draft of the final report will be prepared and submitted to NMPC for review and comment.
- c. Upon resolution of all Client comments, the final report will be approved by the Review Project Engineer and Engineering Management Sponsor and issued to NMPC.

6.0 FILING

6.1 The responsible engineer shall assemble all the individual documents and Review Plans necessary to clearly present the results of the design review performed for a specific task. As a minimum, the Design Verification Package shall contain:

- a. Attachment 1 - Review Licensing Related and Design Documents
- b. Attachment 2 - Review Licensing and Design Commitments



- b. Attachment 2 - Review Licensing and Design Commitments
- c. Attachments 3 and/or 4 - Review Plans for Calculations and/or Documents
- d. Attachment 6 - Task Review Summary

6.2 For details on the indexing and filing of the documents listed in paragraph 6.1, See Review Project Procedure RPP-5-0, Section 3.0, Project Files.

6.2.1 Attachment 6 is unique to each task of a system for a given discipline. Copies for each task reviewed within a given system for a given discipline shall be filed in the Task Job Book for that discipline.

6.2.2 Attachment 7 is unique to each system for a given discipline. Copies for each system reviewed by a discipline shall be filed in the job book for that discipline.

6.2.3 Attachment 8 is unique to each system. The Review Summary and attached system summaries shall be filed according to system in the Review Summary Job Book.

6.3 Numbering

6.3.1 In order to identify a Review Plan (Attachments 1, 2, 3, 4, 6) used in a review as unique to that specific review, the Attachments shall be assigned sequence numbers from the appropriate job book lists according to Review Project Procedure RPP-5-0 Section 3.0, Project Files. The identification number consists of the following items:

Example: E - xxx - 14 - 1

(a) (b) (c) (d - Attachments 3 and 4 only)

a. Identifies the discipline of the Lead Engineer responsible for the review and the specific job book to which the review is assigned and in which it is filed. The possible letter designations are:

N - EMD

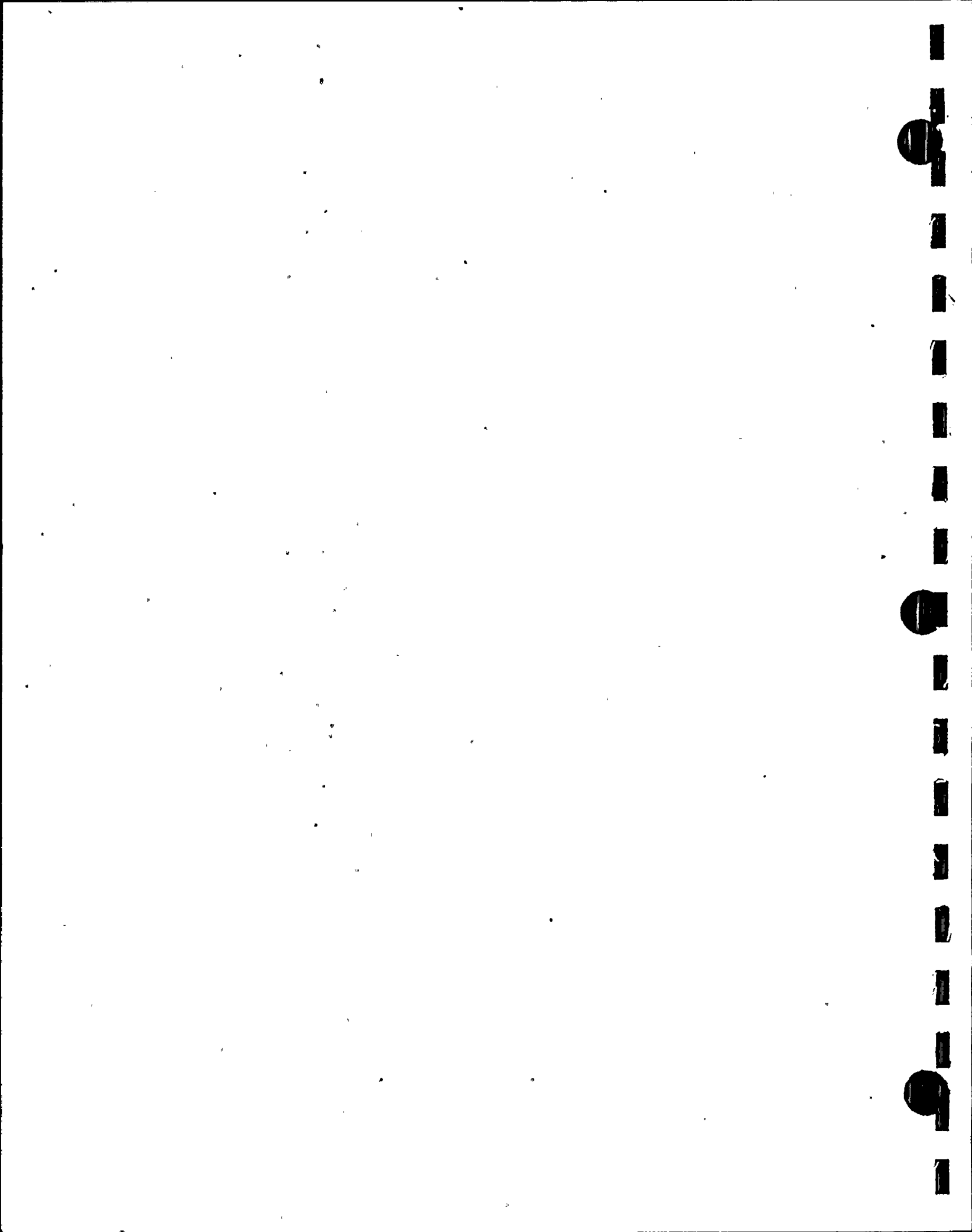
S - Structural G - General

E - Electrical

P - Power

F - Field

C - Controls



- b. Identifies the system for which the review was done according to the tab numbers of the Task Job Book:

SWP - Service Water System S - Structure

EPS - Onsite Emergency AC Power System

CST - Construction

EQP - Equipment Qualification Program

- c. Identifies the specific task number this form belongs to; taken from the appropriate job book index.
- d. Identifies sequential subnumber for Attachments 3 and 4 used in one task review.





8.0 ATTACHMENTS

Attachment 1 - Task Review Licensing Related and Design Documents

Attachment 2 - Task Review Licensing and Design Commitments

Attachment 3 - Calculation Review Plan

Attachment 4 - Document Review Plan

Attachment 5 - Open Item Report (OIR)

Attachment 6 - Task Review Summary

Attachment 7 - System Summary Sheet

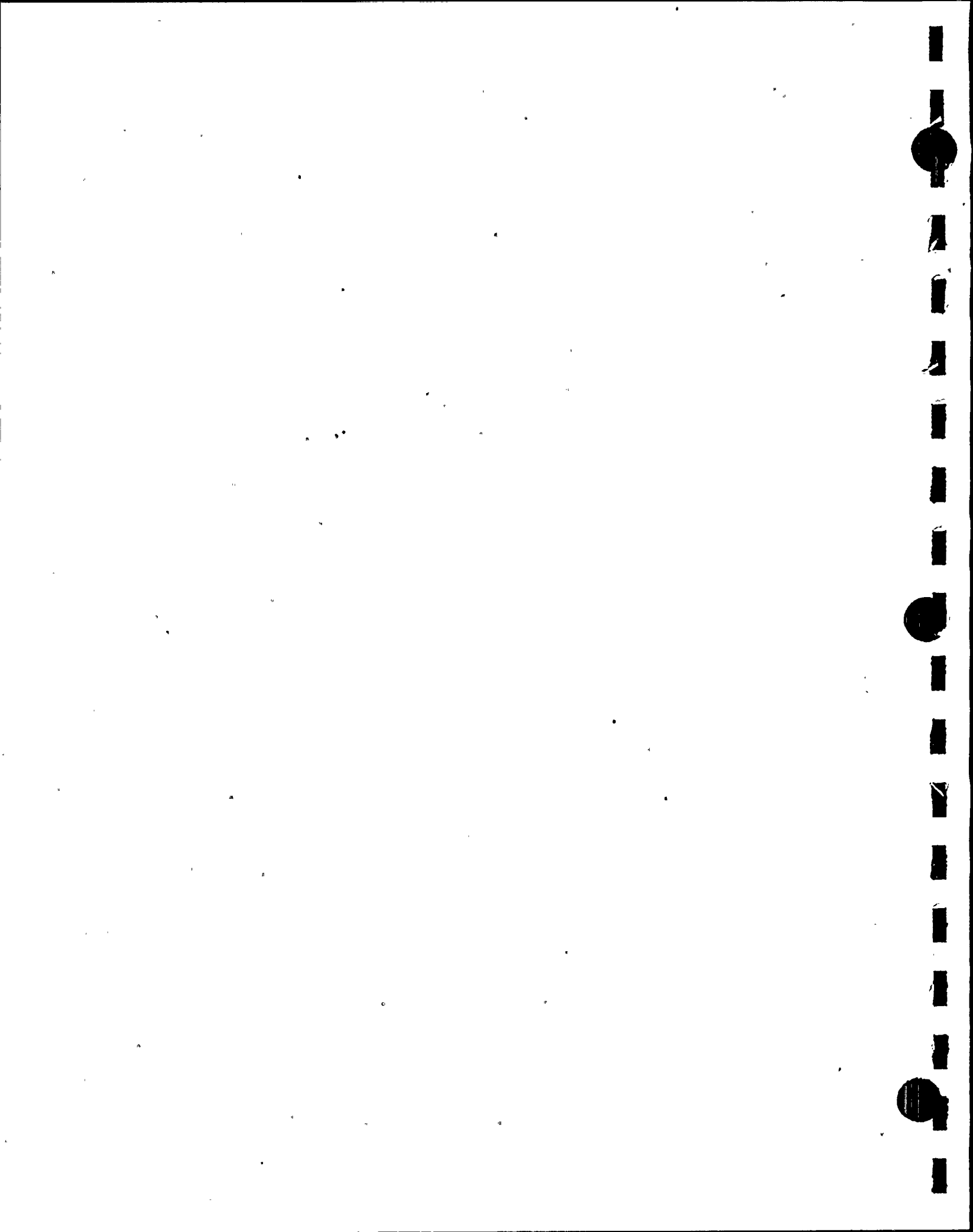
Attachment 8 - System Review Summary

Attachment 9 - Potential Discrepancy (PD) Report

Attachment 10 - Open Item Report Log

Attachment 11 - Potential Discrepancy Log

Attachment 12 - Flow Chart



Attachment 1
Page 1 of 1

TASK REVIEW LICENSING RELATED AND DESIGN DOCUMENTS
TASK NO.

Instructions:

List all licensing related and design documents that apply to a specific task assigned for review. Identify the title, identification/revision, and issue date. Attach additional pages when needed.

DOCUMENT TITLE

IDENTIFICATION/REVISION

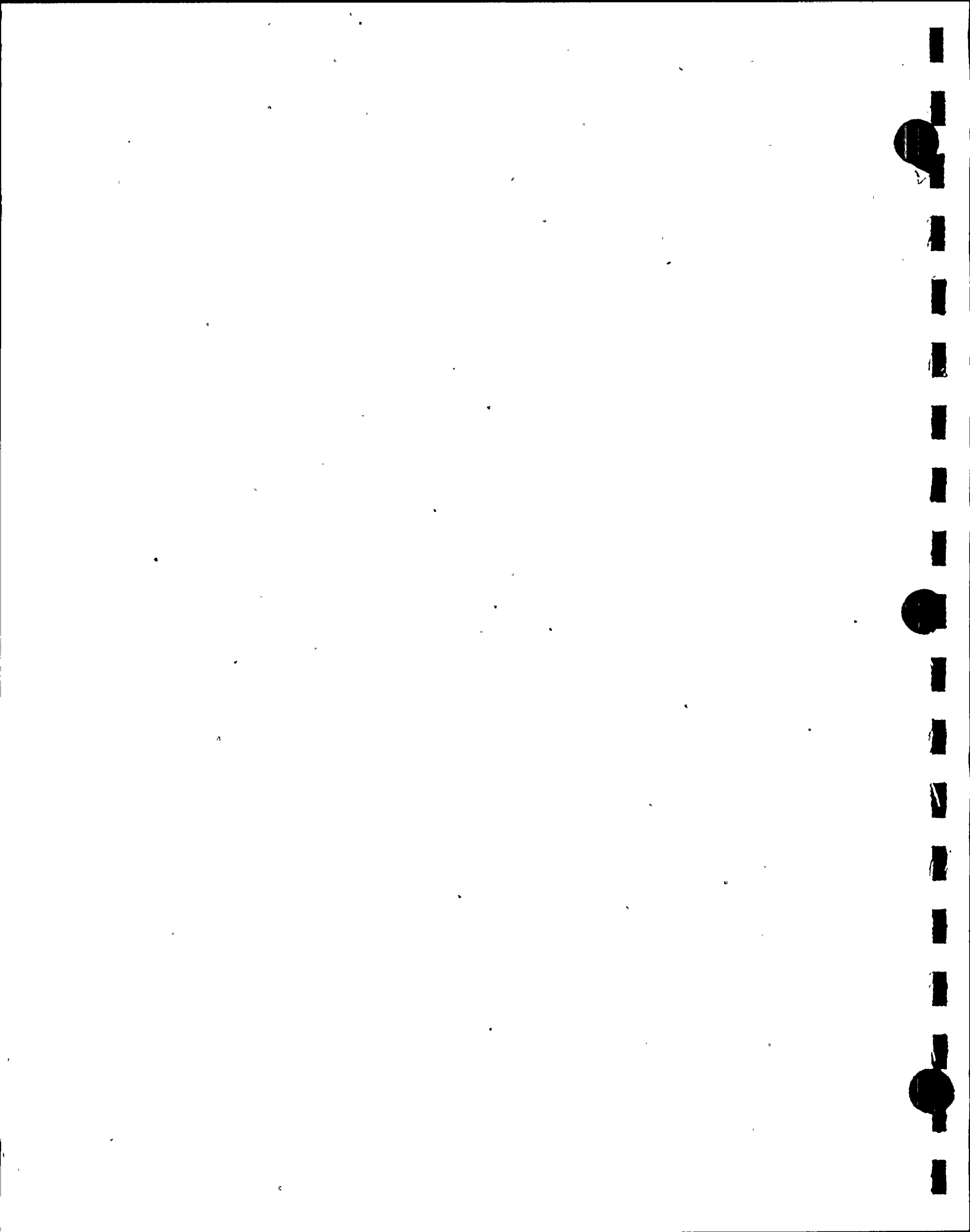
ISSUE DATE

Responsible Engineer

Date _____

Lead Engineer

Date



STONE & WEBSTER ENGINEERING CORPORATION
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - NPP UNIT NO. 2
INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 2
Page 1 of 1

TASK REVIEW - LICENSING AND DESIGN COMMITMENTS
TASK NO. _____

Instructions:

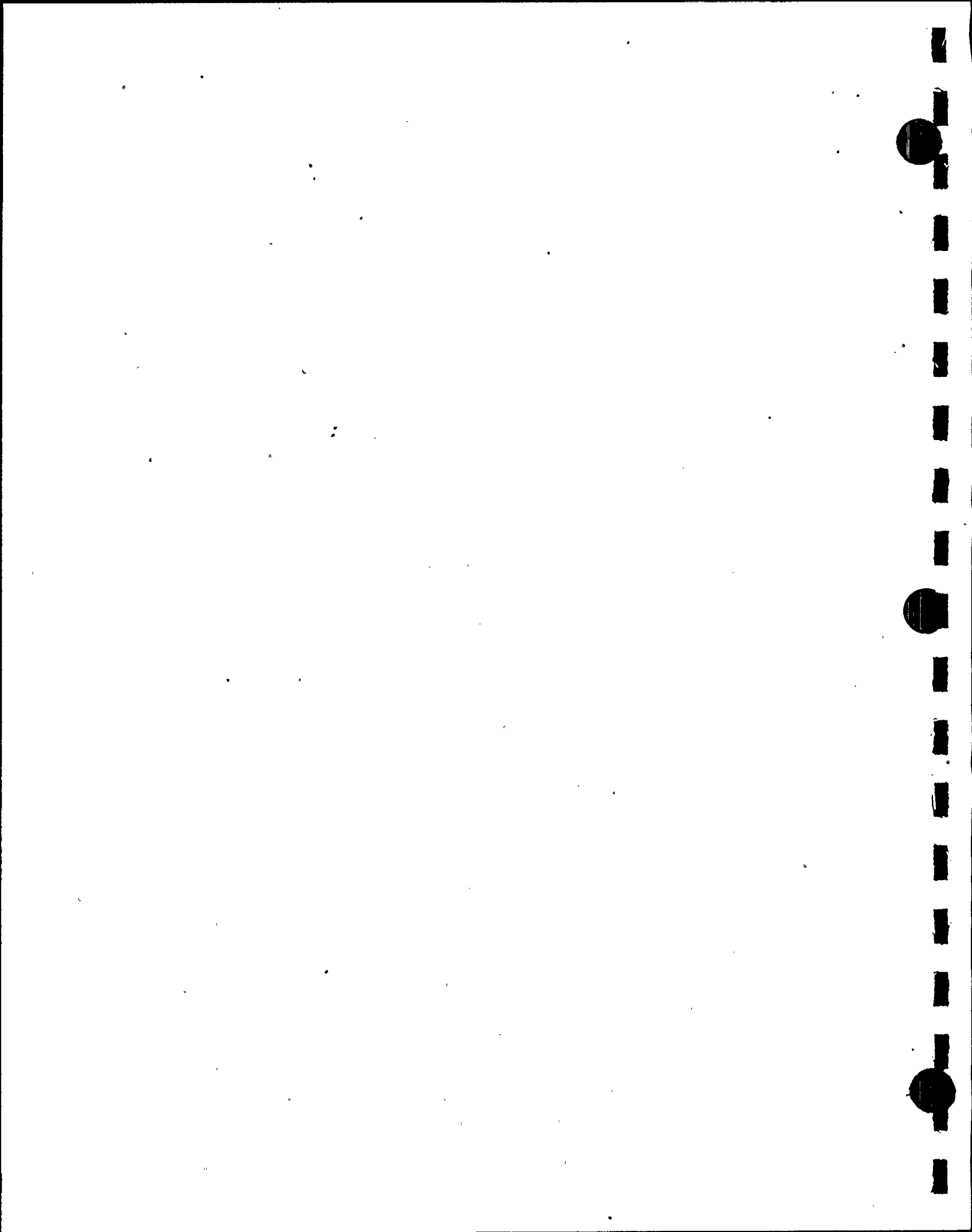
Review the licensing related and design documents listed in Attachment 1 for this review and identify the specific commitments applicable to the review by listing the commitments below, attaching photocopies of the appropriate pages, or identify the specific page and paragraph from the applicable documents. Attach additional pages when needed.

Responsible Engineer

Date

Lead Engineer

Date



STONE & WEBSTER ENGINEERING CORPORATION
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INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 3
Page 1 of 5

CALCULATION REVIEW PLAN

TASK NO. _____

SYSTEM _____

I. GENERAL INFORMATION

NMP-2 Original

Calc. Title: _____

NMP-2 Calc. No./Date _____ / _____
(Include Current Rev. No.)

File Location _____

Calculation Description _____

Purpose of Review _____

II. REVIEW METHOD

1. Identification

- a. Mark the review method used below.
- b. If an alternate calculation was prepared also complete Section III.
- c. If a Design Review was performed also complete Sections III and IV.

☐ Alternate Calc.

☐ Calculation
or Design Review

III. RESULTS SUMMARY

- 1. Based upon an Alternate Calculation, or a Calculation Design Review of the attributes selected in Section IV, it was determined that the referenced document: (Mark the appropriate block.)

☐ is correct and satisfactory
and requires no further
action/reporting.

☐ exhibits evidence of an apparent
error or inconsistency that has
been verified and is reportable
as an open item.

Open Item No.(s) _____

Responsible Engineer

Date

Lead Engineer

Date

STONE & WEBSTER ENGINEERING CORPORATION
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT - NPP UNIT NO. 2
INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 3
Page 2 of 5

IV. REVIEW INSTRUCTIONS

1. Complete the following records to document the results of the review. For each parameter noted indicate whether the document reviewed was satisfactory/unsatisfactory in REMARKS. As a minimum, describe all unsatisfactory conditions in REMARKS.
2. Identify all significant parameters from the Review Licensing and Design Commitment list No. ____ - ____ - ____ and determine whether:
 - a. Inputs where correctly selected and incorporated into design.

COMMITMENT
ITEM NO.

INPUT SELECTED

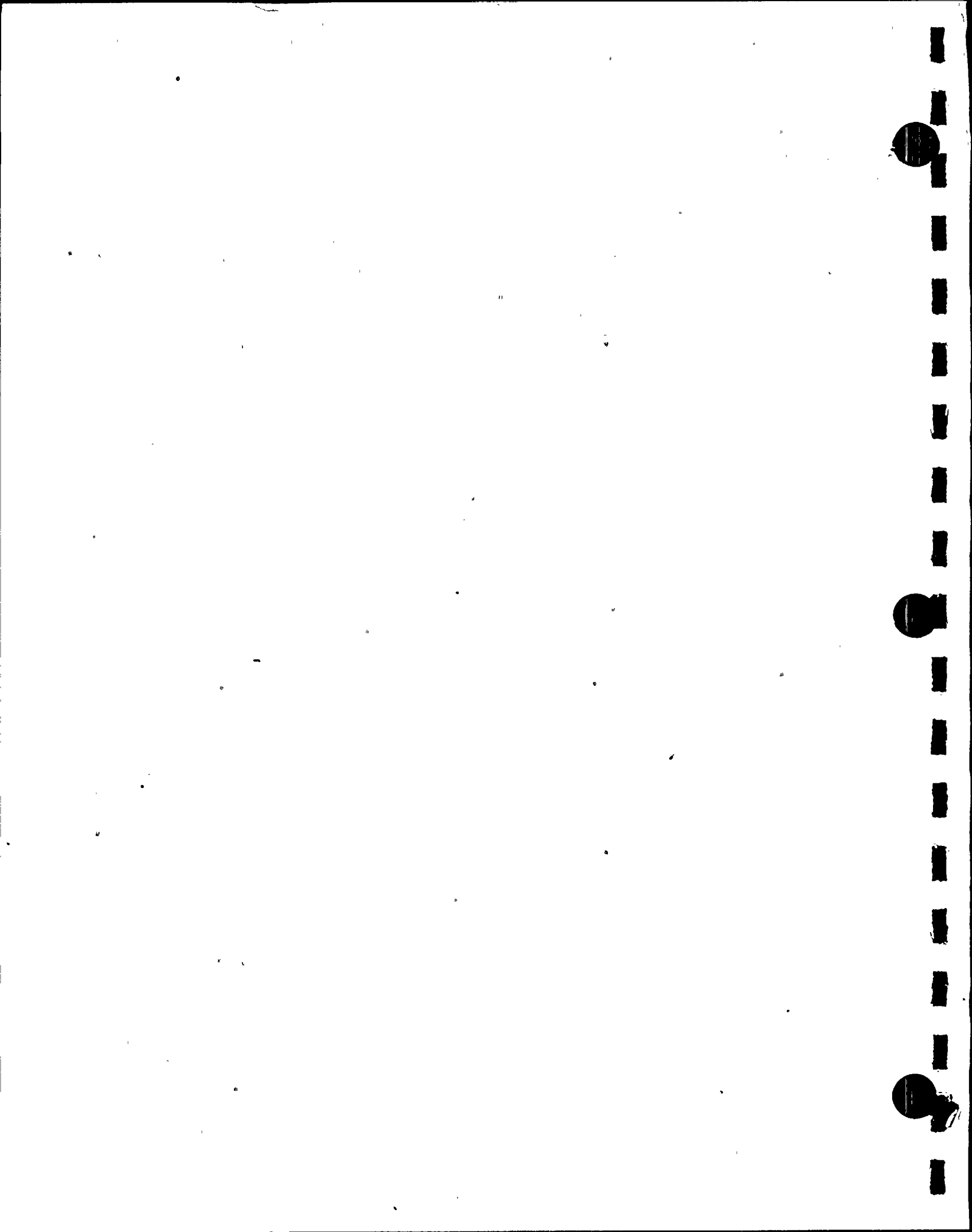
REMARKS

- b. Assumptions necessary to perform the design activity are adequately described, reasonable, and reverified as required.

COMMITMENT
ITEM NO.

ASSUMPTIONS SELECTED

REMARKS



STONE & WEBSTER ENGINEERING CORPORATION
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NINE MILE POINT - NPP UNIT NO. 2
INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 3
Page 3 of 5

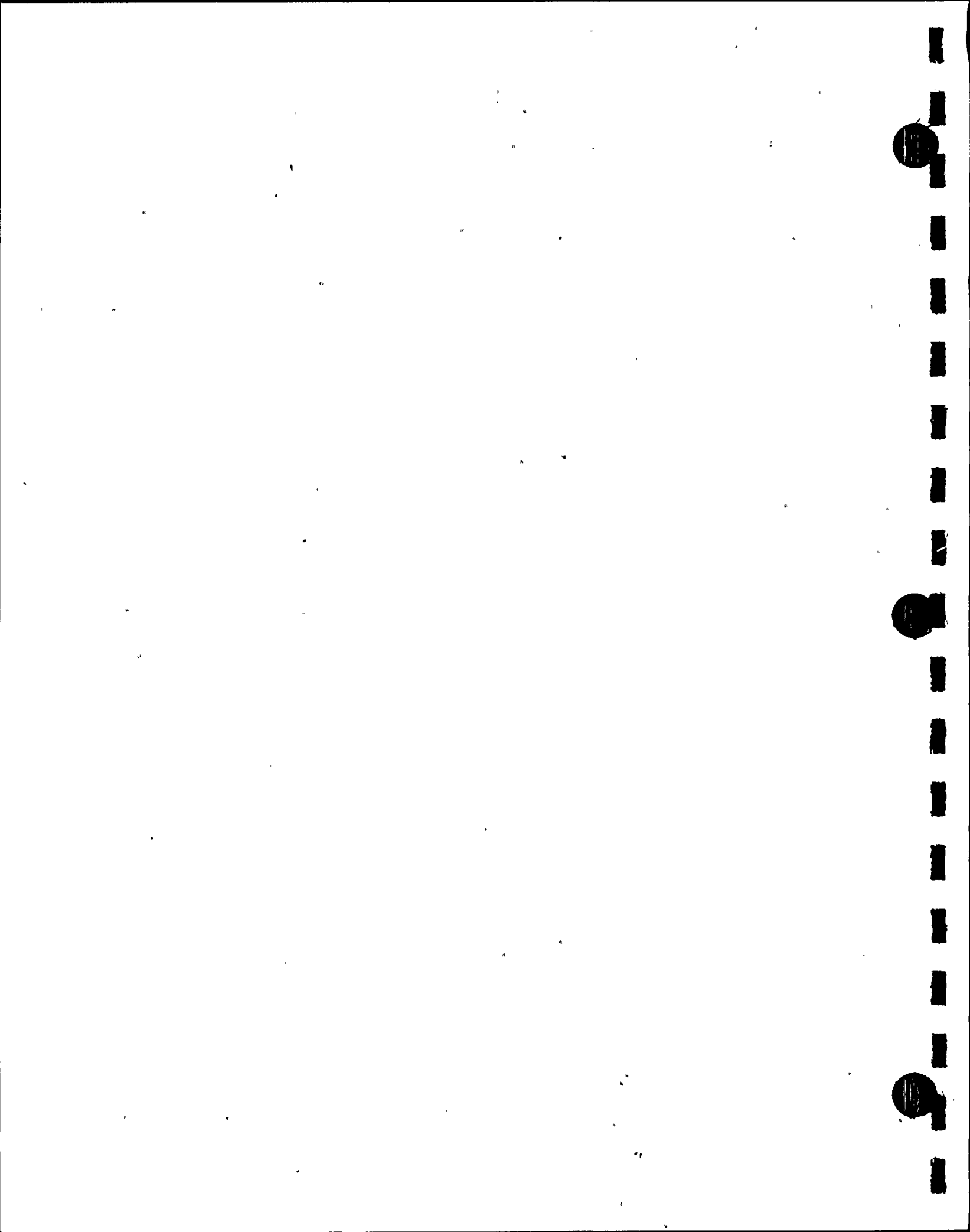
- c. Applicable codes, standards, and regulatory requirements for design have been met.

<u>COMMITMENT ITEM NO.</u>	<u>CODES, STANDARDS, AND REGULATORY REQUIREMENT SELECTED</u>	<u>REMARKS</u>
--------------------------------	--	----------------

- d. Design interface requirements have been satisfied.

NOTE: The reviewer shall obtain the initials (in REMARKS) of the interfacing disciplines' Lead or Responsible Engineer as acknowledgement that the information transfer was utilized where required

<u>DESIGN INTERFACE REQUIREMENTS SELECTED</u>	<u>INTERFACE DOCUMENT (FINAL DOCUMENT)</u>	<u>REMARKS</u>
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NINE MILE POINT - NPP UNIT NO. 2
INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 3
Page 4 of 5

- e. An appropriate design (calculation) method was used.

DESIGN (CALCULATION) METHOD USED

REMARKS

- f. Inputs are current and the output is verified to meet the requirements of the application.

INPUT/OUTPUT SELECTED

REMARKS



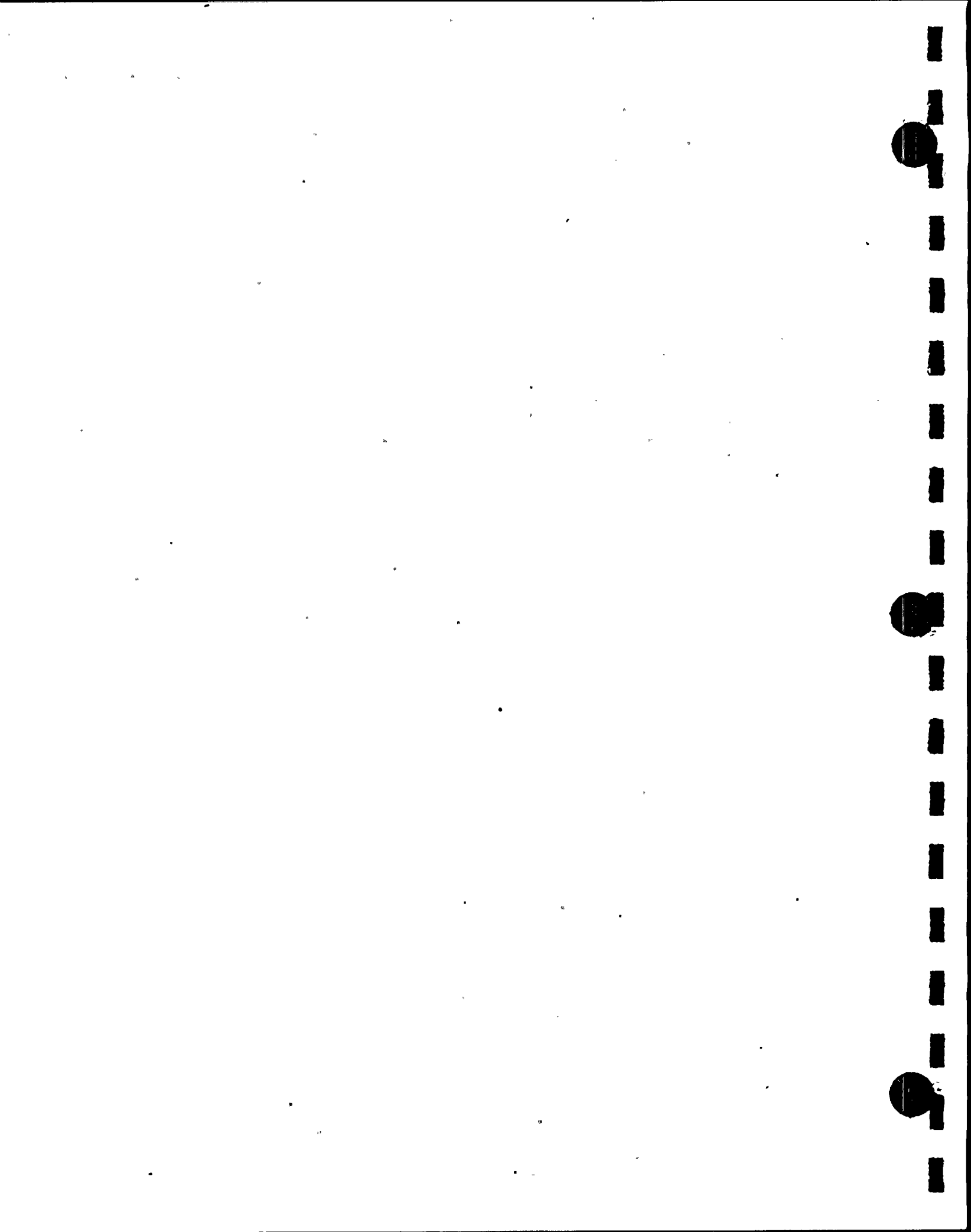
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NINE MILE POINT - NPP UNIT NO. 2
INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 3
Page 5 of 5

3. Document any supplemental parameters identified for review. Denote N/A (Not Applicable) in SUPPLEMENTAL PARAMETERS SELECTED if no supplemental parameters are identified.

SUPPLEMENTAL PARAMETERS SELECTED

REMARKS



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INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 4
Page 1 of 4

DOCUMENT REVIEW PLAN

TASK NO. ____ - ____ - ____ - ____

SYSTEM _____

I. GENERAL INFORMATION

Type of Document _____

Document Title _____

Document/
Rev. No. _____ Date _____

Outstanding
Change Requests _____

II. RESULTS SUMMARY

Based upon a Design Review of the attributes selected in Section III. of this Review Plan, it was determined that the items identified in Section III from the referenced document; (Mark the appropriate block.)

☐ are correct and satisfactory
and require no further
action/reporting.

☐ exhibit evidence of an
apparent error or
inconsistency that has
not been verified and
is reportable as an
open item. (See
Section III).

Open Item No.(s) _____

Responsible Engineer

Date

Lead Engineer

Date

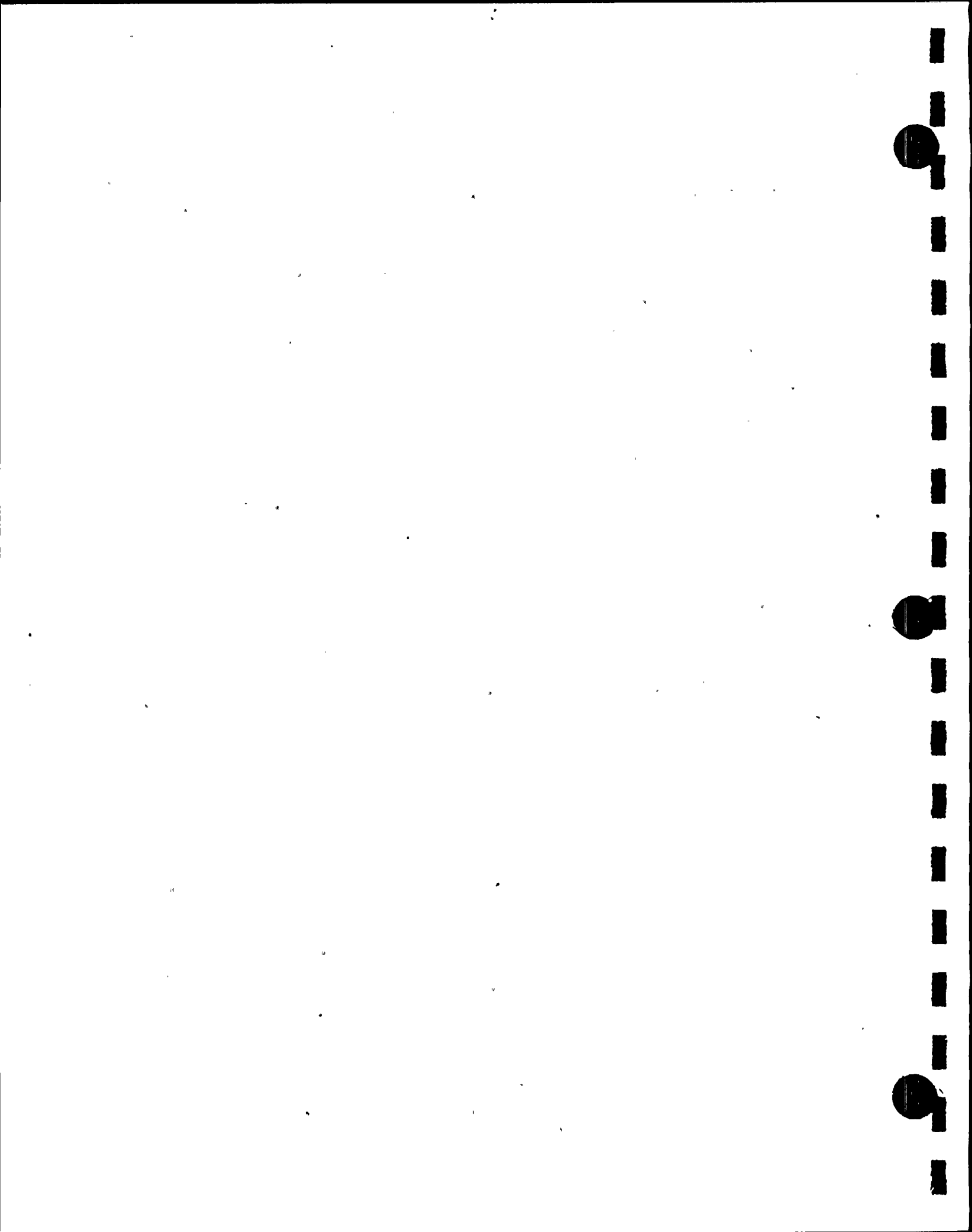


III. REVIEW SUMMARY

1. Identify the purpose of the review (areas of concern).

- | | |
|--|--|
| <input type="checkbox"/> Separation | <input type="checkbox"/> TMI Requirements |
| <input type="checkbox"/> Redundancy | <input type="checkbox"/> Interdiscipline Communication |
| <input type="checkbox"/> Calculation Results | |
| <input type="checkbox"/> Equipment Qualification | |
| <input type="checkbox"/> Pipe Schedule, Diameter, Design Pressure or Temperature | |
| <input type="checkbox"/> Other: _____ | |
| Specify | |

2. Identify additional documents that provide technical backup data.



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NINE MILE POINT - NPP UNIT NO. 2
INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 4
Page 3 of 4

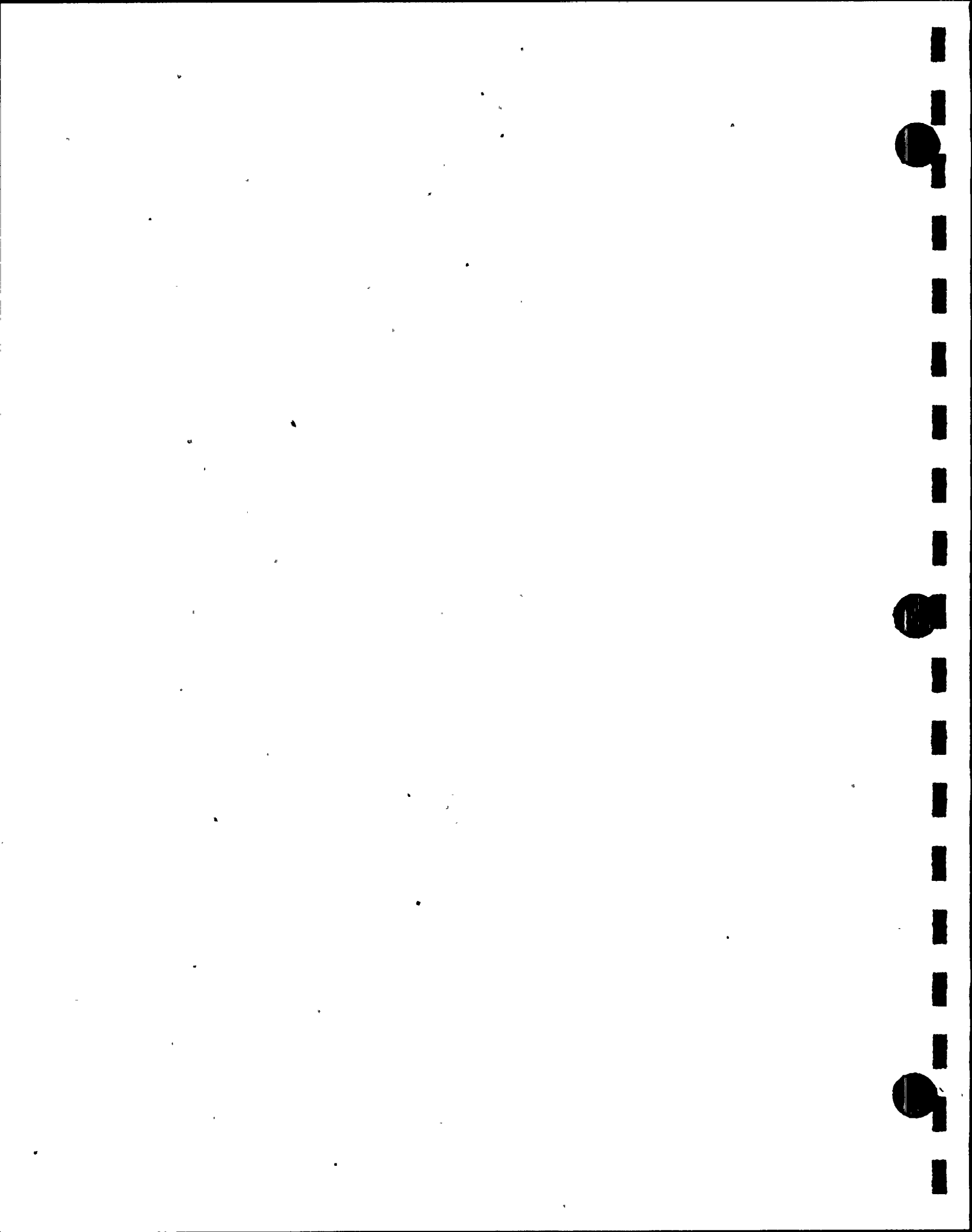
IV. REVIEW INSTRUCTIONS

Complete the following records to document the results of the review. For each parameter noted, indicate whether the document reviewed was satisfactory/unsatisfactory in REMARKS. As a minimum, describe all unsatisfactory conditions in REMARKS. Identify the significant parameters/characteristics including those from the Licensing and Design Commitment list and explain their impact on the review.

A. TECHNICAL REVIEW

PARAMETERS/CHARACTERISTICS
SELECTED FOR REVIEW

REMARKS



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Attachment 4
Page 4 of 4

B. INTERDISCIPLINE COMMUNICATION REVIEW

PARAMETERS/CHARACTERISTICS
SELECTED FOR REVIEW

REMARKS



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INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 5
Page 1 of 1

OPEN ITEM REPORT (OIR)
OIR _____

SYSTEM _____

DISCIPLINE SUBJECT _____

TASK NO. _____

DESCRIPTION:

1. Documents/Rev. No.
2. Related Documents

Significance of Concern

Originator/Date: _____

REVIEW RESOLUTION:

Item found to be acceptable

Item is open; further resolution required and item is reported as Potential
Discrepancy No. _____

REVIEWED BY:

Lead Electrical _____ Date _____

Lead Power _____

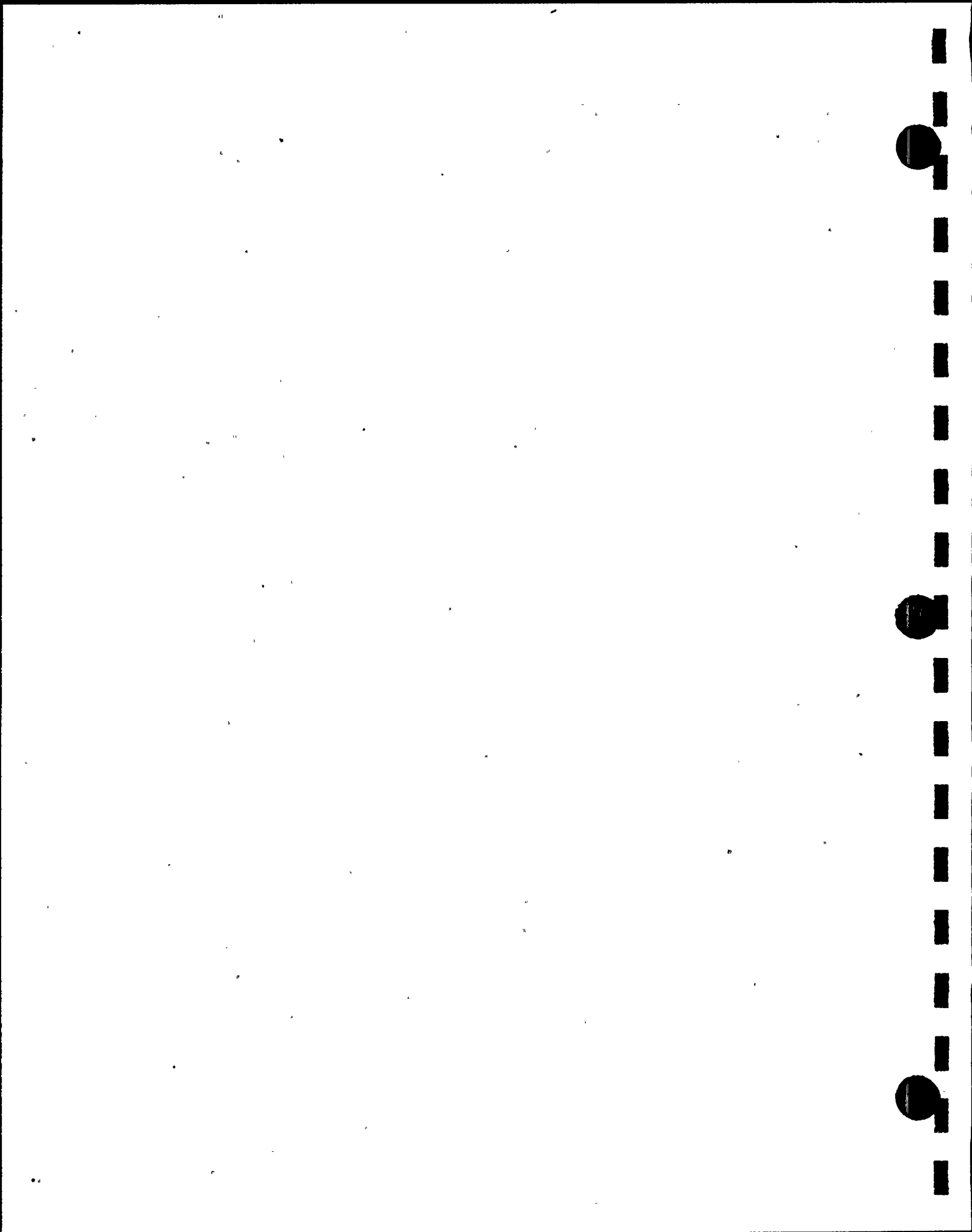
Lead Structural _____

Lead Controls _____

Lead EMD _____

Review Project Engineer _____

Engineer Management Sponsor _____



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Attachment 6
Page 1 of 1

TASK REVIEW SUMMARY

TASK NO. ____ - ____ - ____
SYSTEM _____

TASK TITLE _____

TASK OBJECTIVE: _____

CONCLUSION: (add additional pages as necessary).

All task items are correct and
require no further action/
reporting

The following discrepancy
items exist:

COMMENTS:

Responsible Engineer

Date

Lead Engineer

Date

C2/1217773/1A/2RH

03/074/83

STONE & WEBSTER



SYSTEM SUMMARY SHEET

DISCIPLINE: _____

SYSTEM: _____

I. INSTRUCTIONS

The Lead Engineer shall review all Task Review Summaries for the system and report the results below.

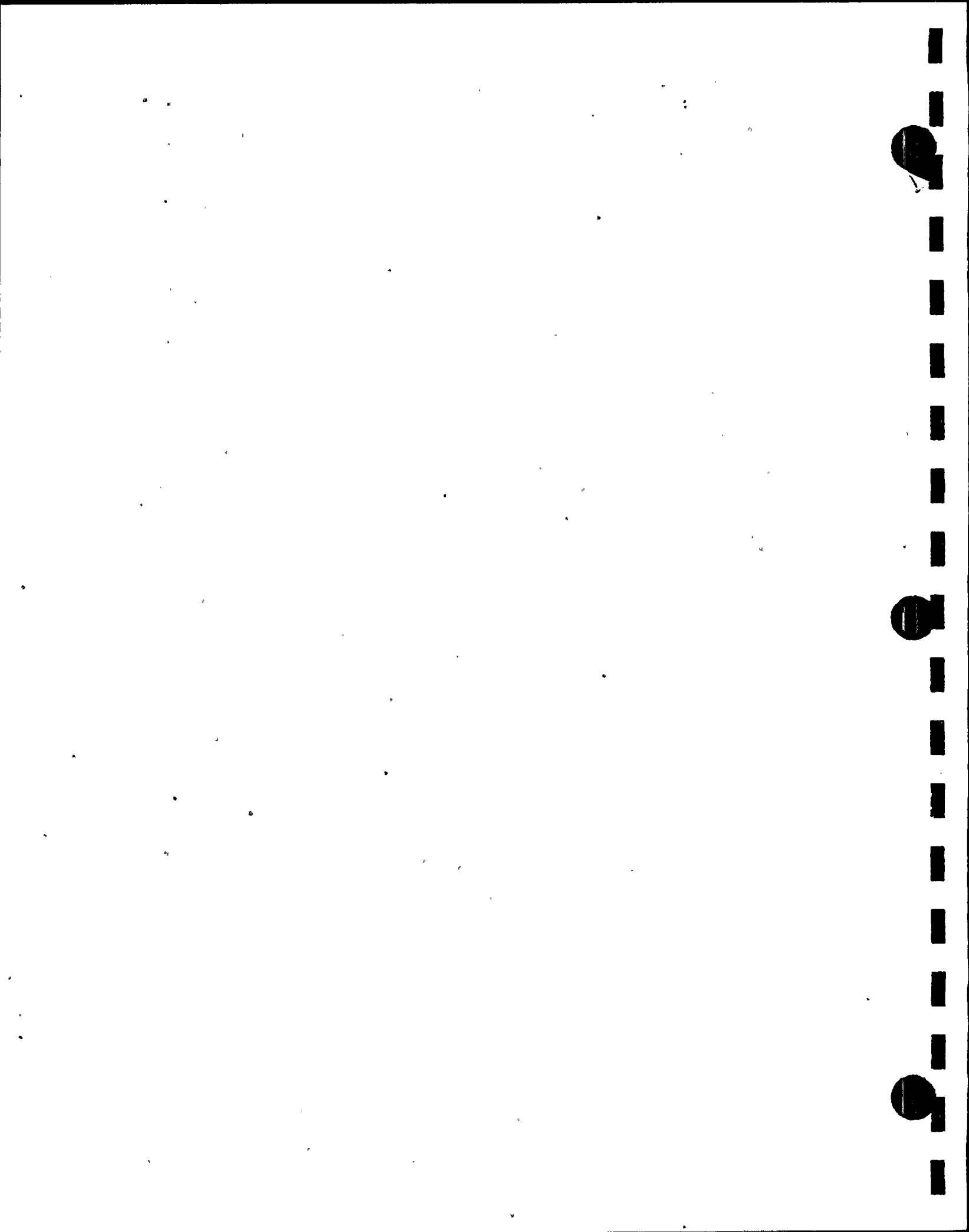
II. SUMMARY

1. Total number of Task Review Summaries used to complete the system discipline review: _____
2. Remarks

All task items are correct and require no further action/reporting
Potential discrepancy items exist.

Lead Engineer

Date



SYSTEM REVIEW SUMMARY

SYSTEM: _____

1. The results of the reviews by the individuals assigned to review the design of this system are provided in the System Summary Sheets attached to this cover sheet.
2. The specific details of each review represented in the summaries are filed in the appropriate discipline job book by system and task.

This system has been reviewed and no potential discrepancies were found.

This system has been reviewed and all potential discrepancies have been noted and reported according to the Review Project Procedure RPP-1, Section 5.

Review Project Engineer.

Date



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INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 9
Page 1 of 1

POTENTIAL DISCREPANCY (P.D.) REPORT

P.D. No. _____

System _____

Discipline Subject _____

Task No. _____

Open Item Report No. _____

DESCRIPTION:

Originator _____

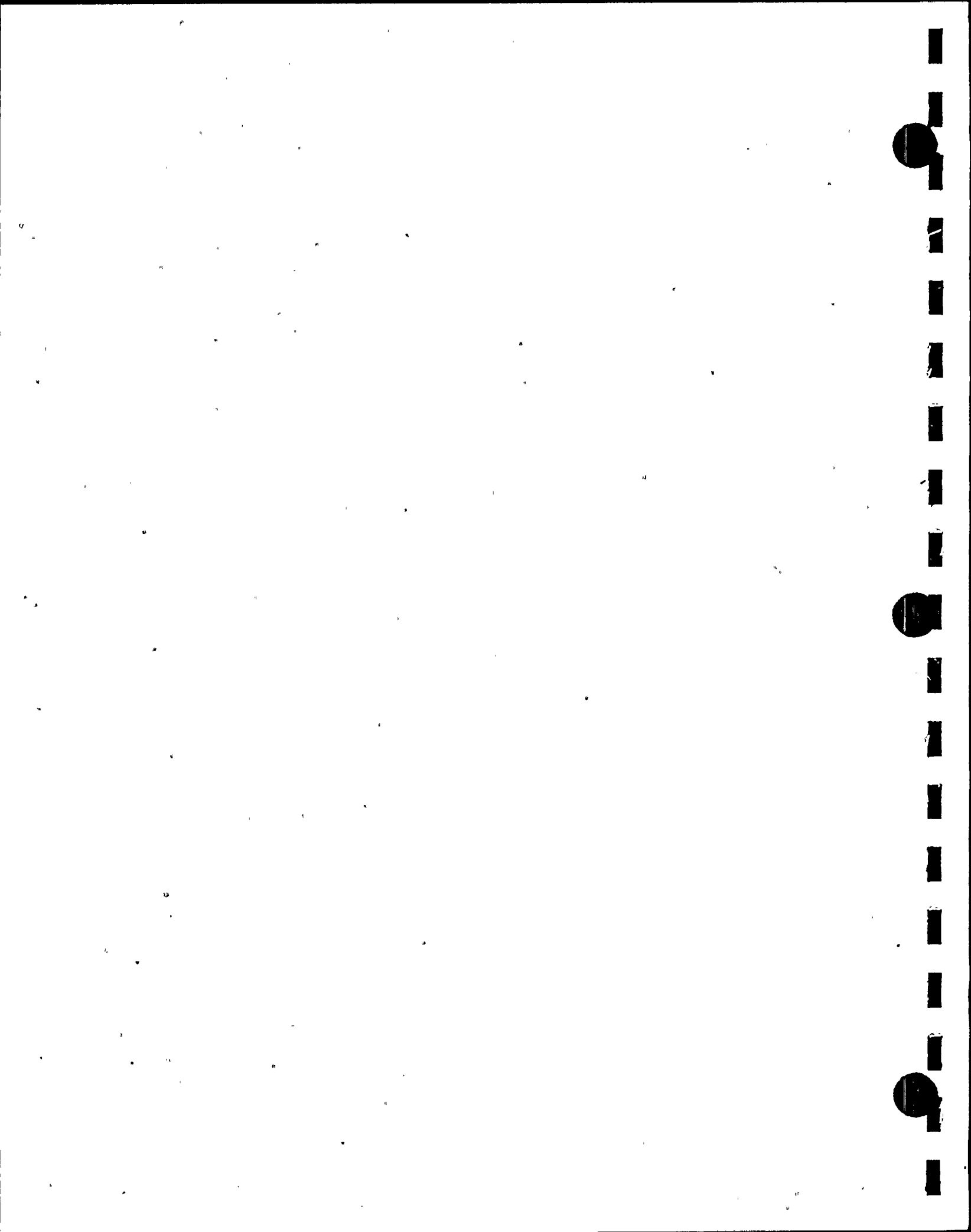
Date _____

Review Project Engineer _____

Date _____

Engineer Management Sponsor _____

Date _____



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NINE MILE POINT - NPP UNIT NO. 2
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Attachment 10
Page 1 of 1

OPEN ITEM REPORT (OIR) LOG

<u>OIR NO.</u>	<u>SUBMITTER DISCIPLINE</u>	<u>DATE SUBMITTED</u>	<u>DATE REVIEWED</u>	<u>POTENTIAL DISCREPANCY NO.</u>	<u>REMARKS</u>
--------------------	---------------------------------	---------------------------	--------------------------	--	----------------

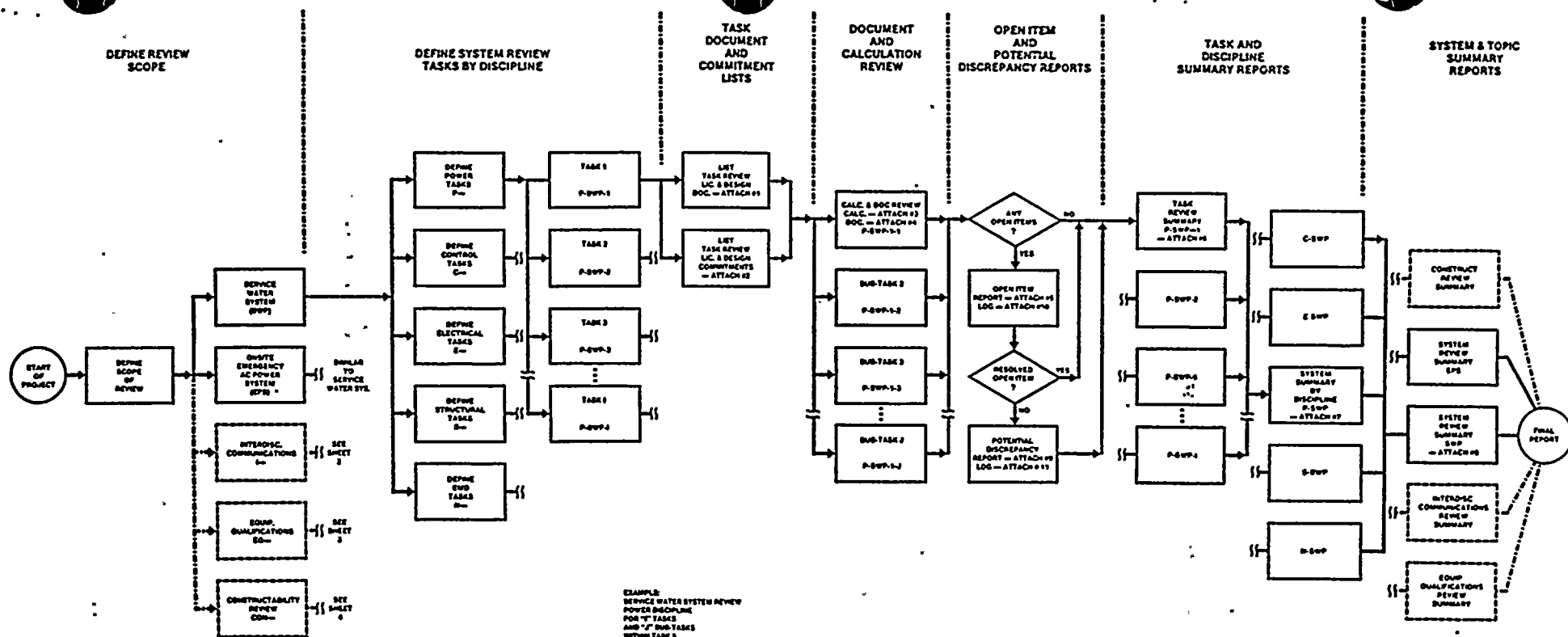


STONE & WEBSTER ENGINEERING CORPORATION
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NINE MILE POINT - NPP UNIT NO. 2
INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 11
Page 1 of 1

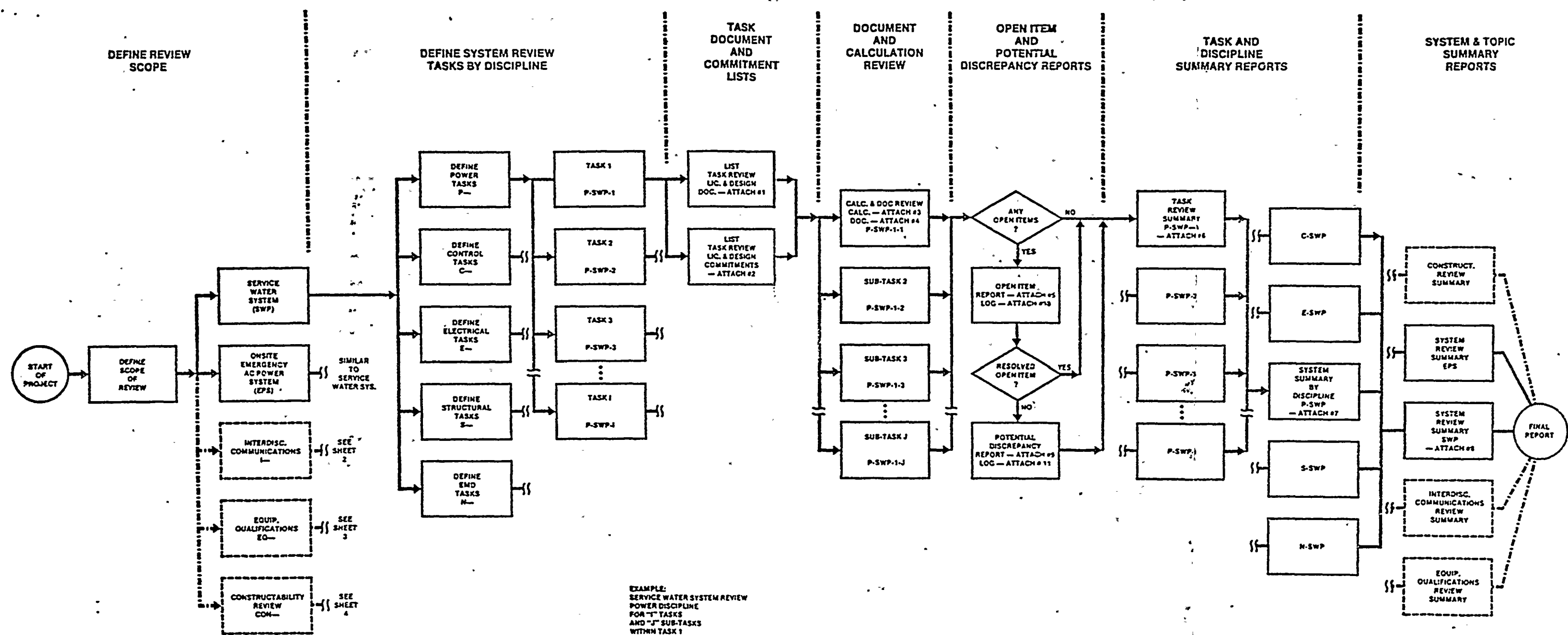
POTENTIAL DISCREPANCY (P.D.) LOG

<u>P.D.</u> <u>NO.</u>	<u>OIR</u> <u>NOS</u>	<u>SYSTEM/</u> <u>SUBSYSTEM</u>	<u>REMARK</u>
---------------------------	--------------------------	------------------------------------	---------------



INDEPENDENT DESIGN REVIEW
FLOW CHART
SHEET #1 — SYSTEM REVIEWS
(SHEET 1 OF 4)





INDEPENDENT DESIGN REVIEW
FLOW CHART
SHEET #1 — SYSTEM REVIEWS
(SHEET 1 OF 4)



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Stone & Webster Engineering Corporation
Niagara Mohawk Power Corporation
Nine Mile Point Nuclear Station - Unit 2
Independent Design Review Program

Albert A. Patterson
Review Project Engineer

REVIEW PROCEDURE FOR CONSTRUCTIBILITY

1.0 PURPOSE

This procedure describes the method by which an independent review of constructibility activities will be accomplished and how potential problems will be identified and recorded, particularly those problems in disciplines of work which have had a history in the nuclear industry of being critical to the completion of construction and turnover for startup of systems.

2.0 SCOPE

- 2.1 Followup on March 1981 ITT Grinnell Report will include determination of what recommendations, if any, remain to be implemented with the piping contractor, ITT Grinnell.
- 2.2 Supports Interferences will include a review of selected areas of previously identified interference problems between supports for large bore pipe/equipment, small bore (field run) pipe, conduit, tubing, and cable tray to determine potential generic problems for remaining work areas.
- 2.3 Installation Practicality will be directed towards Engineering products (specifications, drawings, and changes thereto) for portions of the systems selected for independent review (service water and onsite emergency ac power) to determine the extent to which these products represent constructible design and to identify any potential generic problems that may pertain to engineering products yet to be issued for construction.
- 2.4 Clarity and Completeness of Engineering Products Issued for Construction Use (Drawing Quality) will include a review of specific problems raised by Construction (contractors) and the determination of potential generic problems that may pertain to products yet to be issued for construction.

3.0 PROCEDURE, GENERAL

Constructibility review in each of the four areas: (1) March 1981 ITT Grinnell Report, (2) Supports, (3) Installation Practicality, (4) Drawing Quality, will be accomplished through direct communication with site (contractors and SWEC) and CHOC project personnel, checking content of selected Engineering products, identifying and documenting apparent problems with a common presentation format, and evaluating the identified problems in terms of their potential for delaying the remaining construction activities. Particular emphasis will be placed on those disciplines with a history in the nuclear industry of being critical to completion of construction and turn-



over of systems for startup, e.g., pipe hangers, small bore pipe installation, system continuity (flushing, hydro, insulation), instrumentation installation, cable tray and conduit installation, cable pull and cable termination, fire protection and separation, and open licensing issues that can affect hardware.

4.0 PROCEDURE, TASKS

4.1 Followup on March 1981 Report on ITT Grinnell Piping Erection Activities

- 4.1.1 Review the conclusions from the report, and briefly document which of the recommendations have been or are being implemented.
- 4.1.2 Identify any recommendations that have not been implemented, and explain why they have not been implemented.
- 4.1.3 Evaluate the potential impact of unimplemented recommendations on remaining piping installation activities.
- 4.1.4 Document this task in accordance with Attachment 1.

4.2 Supports Interferences

- 4.2.1 Investigate reports of supports for field run pipe, tube, conduit, or cable tray taking up space required for large bore pipe, duct, or equipment supports. Attempt to identify six specific cases (some in Category I areas, some in Category II areas) and document each (see Checklist, Attachment 2). Determine cause(s) of interference and the parties responsible for the problem.
- 4.2.2 Follow up with responsible parties to determine if a generic problem exists with issued-for-construction documents and/or with those remaining to be issued.
- 4.2.3 Evaluate potential for this problem delaying remaining construction activities.
- 4.2.4 Document these investigations, causes, evaluations, and followup activities in accordance with Attachment 1.

4.3 Installation Practicality

- 4.3.1 Review project procedures and methodology for providing construction knowledge to the engineering and design effort with emphasis on first-issue drawings





and significant changes. (See Checklist, Attachment 3, Sheet 1.)

4.3.2 Review a sampling of drawings, specifications, and changes thereto from the selected systems and evaluate the constructibility aspects of each. Identify and document problems. (See Checklist, Attachment 3, Sheets 2 and 3.)

4.3.3 Conduct interviews with piping and electrical supervisors (and general foremen, where appropriate) and field engineers for contractors and SWEC to identify at least 10 specific constructibility problems.

Investigate in some depth those problems which may be generic and have the greatest potential impact on the remaining construction activities.

4.3.4 Document results of the review and interviews, and evaluate the potential for delays in the remaining construction activities from impractical installation information.

4.4 Clarity and Completeness of Engineering Products Issued for Construction Use

4.4.1 Investigate reports of problems raised by Construction (contractors) concerning lack of clarity and completeness in the specifications, drawings, E&DCRs, and N&Ds they must use.

4.4.2 Determine whether or not generic problem(s) exists and, if so, document problem(s) in detail.

4.4.3 Evaluate problem(s) in terms of impact on the remaining construction activities.

5.0 REPORT

Compile findings and evaluations into one report, and provide an executive summary.

6.0 ATTACHMENTS

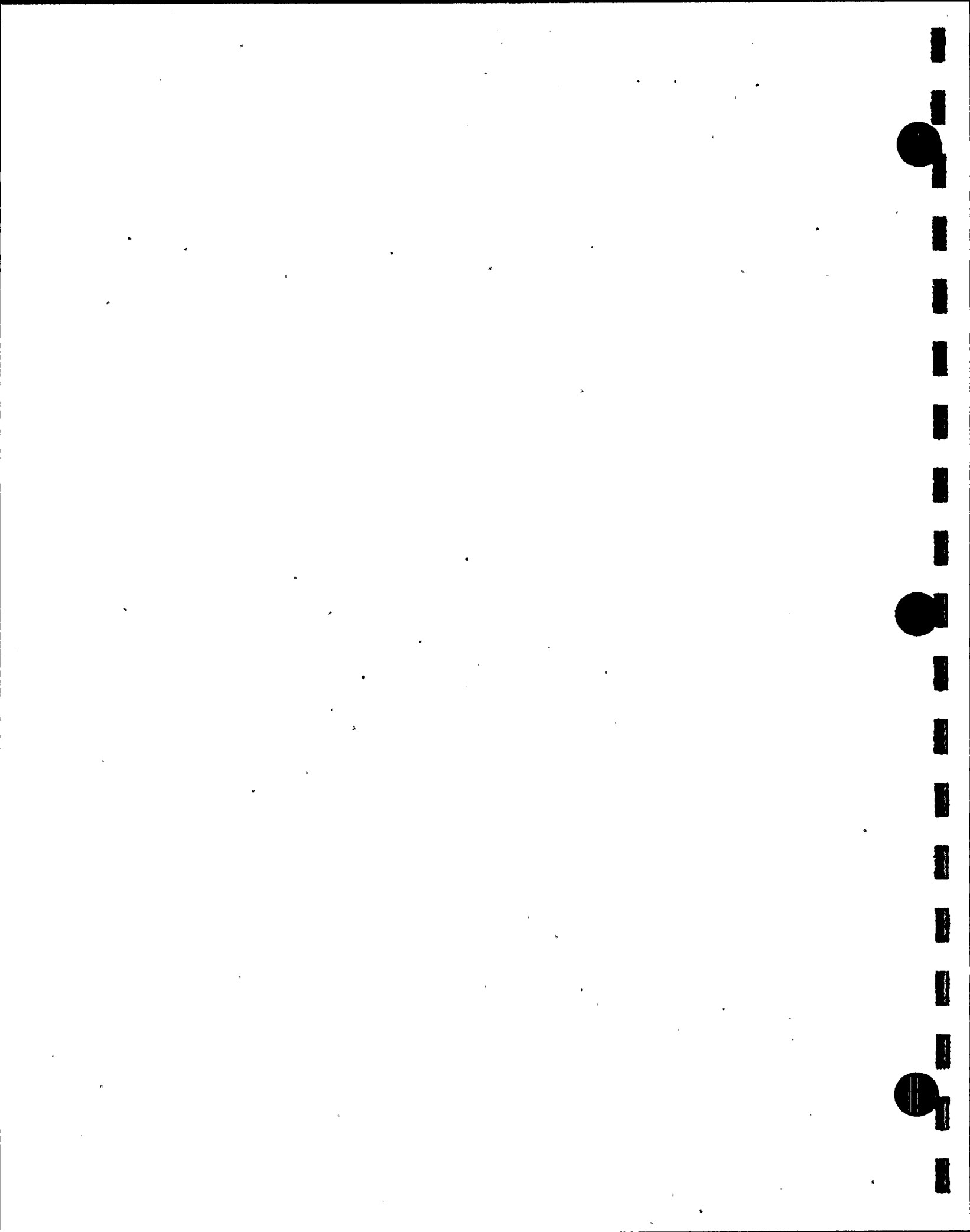
6.1 Standard Format for Task Documentation; Attachment 1

6.2 Supports Interference Checklist; Attachment 2

6.3 Constructibility Procedures and Methodology Checklist (Sheet 1), Specification Checklist (Sheet 2), and Drawing Checklist (Sheet 3); Attachment 3

6.4 Flow Chart for Constructibility Review; Attachment 4.






ATTACHMENT 6.1

CONSTRUCTIBILITY REVIEW FINDING

Task No./Description: _____ Sheet ____ of ____

1. Items of concern/Item under review:
2. Source of information, persons contacted, background on subject matter:
3. Finding
4. Evaluation of potential impact, conclusions

Originated by _____ Review/Concurrence _____
Signature Date Construction Manager
C3/1217773/1/5Y STONE & WEBSTER 



ATTACHMENT 6.2

SUPPORTS INTERFERENCE CHECKLIST

1. Is interference between two contractors or within one?
2. Is the interference due to a field run pipe, conduit, tray, tube, or other item?
3. If yes:
 - a. What requirements was the contractor who is installing the field run item responsible for satisfying?
 - b. Did he satisfy them?
 - c. Were drawings/model available to point out the interference ahead of time?
4. If no:
 - a. Do procedures exist for clearing such an interference prior to drawing issue?
 - b. Do allowed tolerances add up to cause the interference?
5. What planning (e.g., layout, walkdown) took place before installation of the first item? Of the second item (interference discovered)?
6. Is there a procedure for resolving the interference? Is it timely?
7. Is a model used? Would using it be helpful in this instance?
8. How was the interference resolved, and was it in the best interests of the project?
9. Could the interfering supports have been combined into a common support?
10. What was (or would have been) the effect on turnover of either of the systems involved?





ATTACHMENT 6.3

CONSTRUCTIBILITY PROCEDURES AND METHODOLOGY CHECKLIST

1. Is there adequate time for review of pertinent data?
2. How are comments from the reviewer transmitted to the responsible engineer or designer?
3. What does the responsible person do with the reviewer's information?
4. Do changes follow the same procedures as the original design?
5. What is the extent of constructibility reviews provided for E&DCRs, N&Ds, etc?
6. To what extent do Engineering and Construction personnel discuss the necessity for potential changes and their effects on cost and schedule?
7. Are innovative ideas or techniques used as a result of the constructibility review?
8. Review with all participants the quality, legibility, and completeness of all documents produced.
9. Is there coordination between/among contractors to provide supports for more than one discipline, e.g., conduit or tubing on cable tray supports or pipe hangers?
10. How is the model used?
11. How are composites used?





ATTACHMENT 6.3

SPECIFICATION CHECKLIST

1. Is the scope of work completely defined?
2. Are all required definitions provided?
3. Are items specified as "Furnished by Contractor" or "Furnished by Engineers," such as construction services and facilities compatible with project approach and schedule?
4. Are applicable project codes and standards specified?
5. Do erection specifications identify "what to do" rather than "how to do?"
6. Are the requirements for "prior engineering approval" necessary and practical?
7. Are inspection and QA program requirements clearly defined?
8. Are materials/products from one specification compatible with another, e.g., are concrete curing compounds in the concrete placement specification compatible with the requirements of the protective coating specification?
9. Are acceptance criteria achievable and practical?
10. Do contractor specifications define all procedures that the contractor will be required to submit?
11. Have Construction comments been resolved, and have any new comments, objectionable to Construction been incorporated prior to Construction signoff of first-issue specifications?
12. Do contractor specifications prohibit entry to the site of expendable and temporary construction materials not compatible with permanent plant materials?





ATTACHMENT 6.3

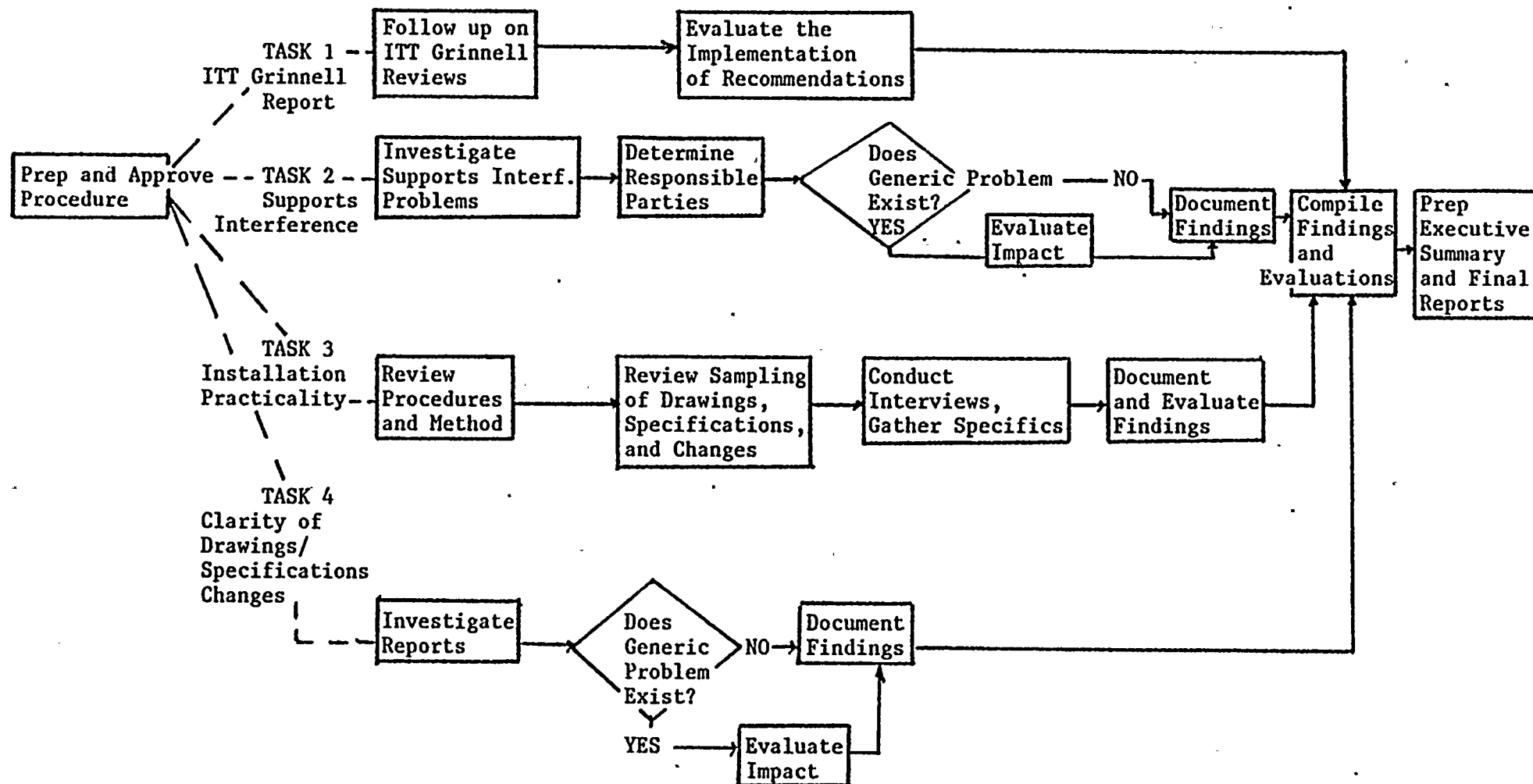
DRAWING CHECKLIST

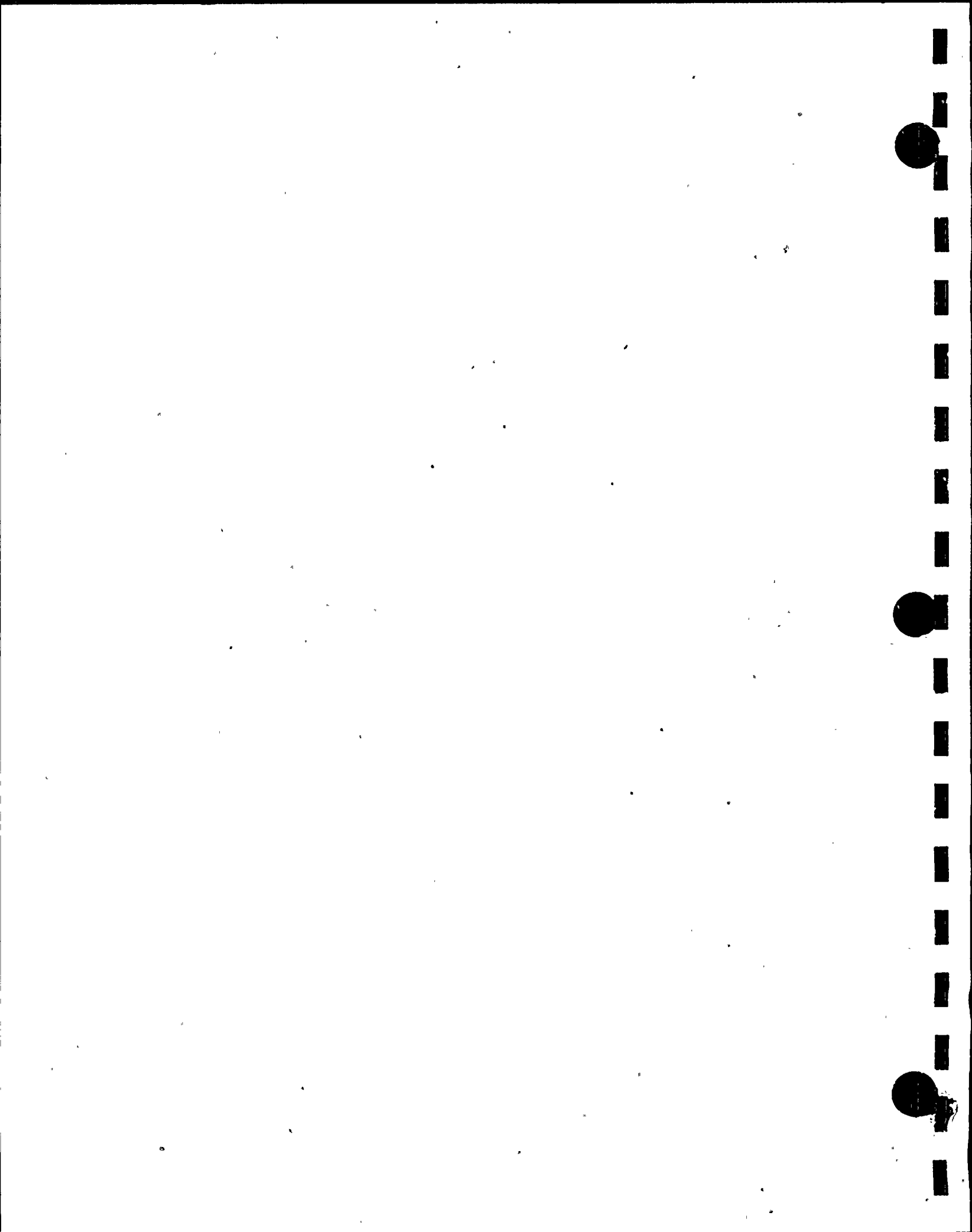
1. Review tolerance criteria to ensure adequate flexibility to suit field conditions.
2. Verify that sufficient details, dimensions, and tolerances are provided for congested areas.
3. Review pipe routing such that it can be supported from nearby structures and is not out in mid-air (distant from floors, ceilings, and walls). Confirm how the model is used for this activity.
4. Verify that released portions of the drawing can stand alone and do not depend on any existing holds.
5. Review field weld locations to ensure that there is maximum ease of accessibility and a minimum number of spool pieces.
6. Verify that instrument tubing to differential pressure instruments is routed such that minimum slopes can be maintained between the root valve and instrument.
7. Verify that there are no requirements or dimensions shown which unintentionally restrict construction, particularly those which may not be necessary to meet engineering requirements.
8. Review details for proper welding technique identification and attempt to minimize bimetallic field welds.
9. Verify that adequate accessibility exists for equipment installation, removal, and maintenance.
10. Verify that piping, conduit, tubing, and instruments are routed in such a manner that they can share common supports or mounts wherever feasible and acceptable to Engineering.
11. Verify that interfaces with other contractors are shown clearly on the drawings.
12. Verify that materials and components specified on the drawings are in accordance with specification requirements.
13. Verify that all vent and drain valves are shown and that they can be readily operated.





ATTACHMENT 6.4





J.O. NO. 12177.73
STONE & WEBSTER ENGINEERING CORPORATION
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT NUCLEAR STATION - UNIT 2
INDEPENDENT DESIGN REVIEW PROGRAM

REVIEW PROJECT PROCEDURE RPP-3-0
Date: March 21, 1983
Page 1 of 1

REVIEW PLAN SCOPE OF WORK

Robert A. Patterson
Review Project Engineer

3-21-83
Date

1.0 PURPOSE

- 1.1 This procedure establishes the scopes of work to be performed by the engineering disciplines involved with the independent design review of the areas identified for Review Project Procedure RPP-1-0, Section 2.0, SCOPE.

2.0 SCOPE

- 2.1 This procedure applies to all work performed under the program for the Independent Review of Key Technical and Interface Concerns for the Nine Mile Point Nuclear Station - Unit 2.

3.0 PROCEDURE

3.1 Interdiscipline Communication

- 3.1.1 The review by all disciplines in the area of Interdiscipline Communication shall be performed according to Attachment 1.

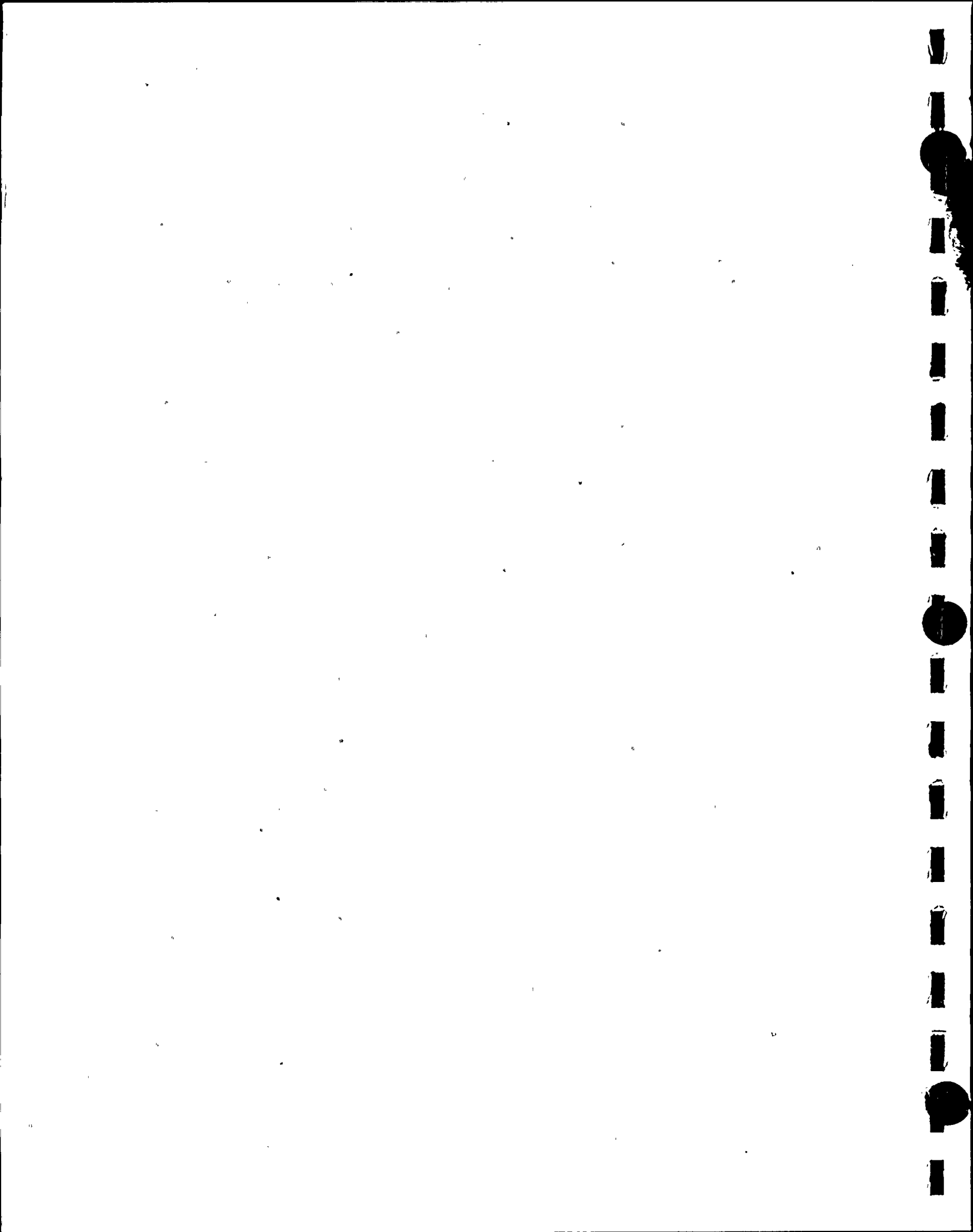
3.2 Equipment Qualification

- 3.2.1 The review required for Equipment Qualification in addition to the areas covered in the individual discipline scope (Section 3.2) shall be performed according to Attachment 2.

- 3.3 The scopes of work to be performed by the following disciplines shall be according to:

- Power (Attachment 3).
- Electrical (Attachment 4).
- Control Systems (Attachment 5).
- Engineering Mechanics (Attachment 6).
- Structural (Attachment 7).





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NINE MILE POINT NUCLEAR STATION - UNIT 2
INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 1
Page 1 of 1

SCOPE OF WORK - INTERDISCIPLINE COMMUNICATION

Determine that the proper flow of design information, system descriptions, and normal communication exists between all engineering disciplines, design functions, vendors, and construction groups such that the development of a system design and incorporation of scope changes proceeds in an efficient manner where all parties are using current finalized controlled design documents.

Typical areas of reviews will include:

The two systems selected for the design review (Service Water System and Onsite Emergency AC Power System) will be used as the basis for the review.

Reviewing project correspondence on selected subjects with the objective of analyzing the information flow between disciplines.

Major design changes incorporated will be reviewed on a random basis for consistency among design documents that describe or support a change. The design change case will be reviewed to ensure that the "change" was routed through all affected disciplines and change information was incorporated in the procurement and construction documents.





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NINE MILE POINT NUCLEAR STATION - UNIT 2
INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 2
Page 1 of 1

SCOPE OF WORK - EQUIPMENT QUALIFICATION

In addition to each discipline's review of equipment within its scope of work, the Project's Equipment Qualification Program, including environmental, seismic, hydrodynamic loads, and operational criteria, will be reviewed for conformance to licensing commitments.





SCOPE OF WORK - POWER

1. Onsite Emergency AC Power System - (EPS)

- a. Ventilation calculations for the standby diesel generator and switchgear areas will be reviewed to determine that adequate flow and cooling capacity have been provided to maintain design temperatures.
- b. Documentation will be reviewed to confirm that adequate fuel oil and pumping capacity have been provided for the standby diesel generators.
- c. The service water system review will confirm that adequate cooling water for the standby diesel generator system has been provided.

2. Service Water System (SWP)

The Service Water System review will concentrate on the safety-related modes of operation. Selected modes of operation will include Loss of Coolant Accident (LOCA), Loss of Offsite Power (LOOP), and coincident LOCA and LOOP.

- a. Selected hydraulic calculations will be reviewed to verify consideration of transient effects, adequate NPSH available, pump capacity, and discharge pressure.
- b. Selected heat load calculations will be reviewed to verify heat exchanger sizing and adequacy of specified service water flow rates.
- c. The adequacy of design pressures and temperatures will be verified for piping, valves, controls, and equipment.
- d. Documentation will be reviewed to ensure adequacy of pump motor horsepower under different operating conditions.
- e. The piping drawings will be compared to the flow diagrams and FSAR to confirm that the pipe arrangements and pipe classes are consistent and correct.
- f. Conditions in the pump suction piping for selected system operating modes will be reviewed to determine the potential for instability.



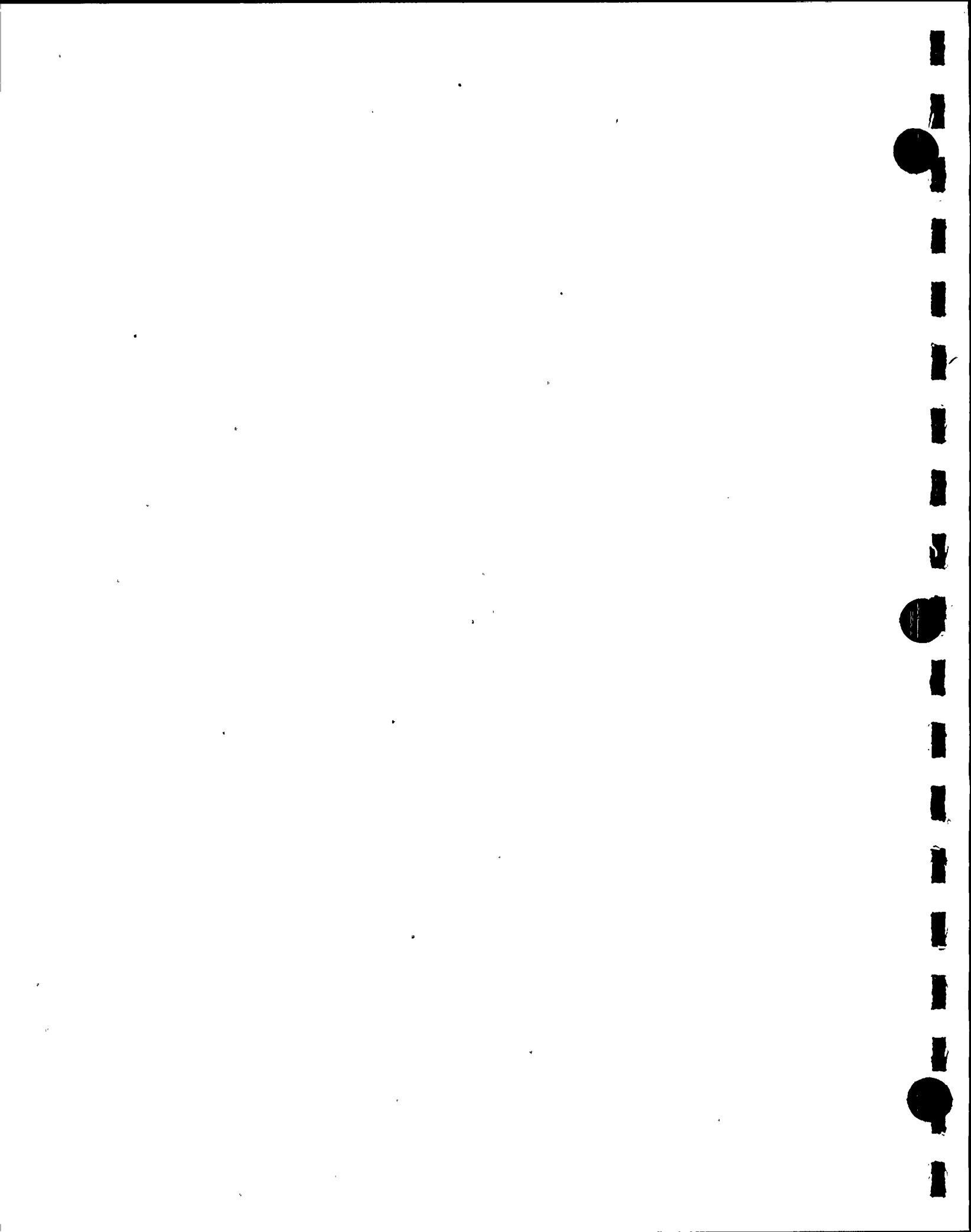
- g. The review will confirm that technical specifications and system design are adequate to meet all licensing commitments.
- h. Ventilation calculations for the service water pump area will be reviewed to determine that adequate flow and cooling capacity have been provided to maintain design temperatures.
- i. The system will be reviewed for compliance with post-TMI requirements of NUREG-0737.
- j. The adequacy of the system design to prevent freezing at the pump intake structure will be confirmed.
- k. Site data and system design provisions will be reviewed to determine the potential for pump strainer and heat exchanger plugging due to biological growth.

3. Single Failure Analysis

The review of the Service Water System (SWP) and the Onsite Emergency AC Power System (EPS) to meet single failure requirements will be performed as follows:

- a. The flow diagrams and system description for the SWP system will be reviewed to determine the ability of the system to perform its intended function assuming that there is a single active failure of a mechanical component in the system.
- b. The Failure Modes and Effects Analysis (FMEA) for the SWP and EPS systems will be reviewed for proper selection of the top event (the selected failure mode of a system).
- c. FMEAs for the selected systems will be reviewed to ensure that all the major system components, as defined in the flow diagrams, have been included in the analysis.
- d. The review will confirm that the FMEAs were developed for the selected system using the latest controlled documents.
- e. The review will confirm that for the selected system, the FMEA findings satisfy one of the following categories:
 - 1) There are no single failures.
 - 2) There is adequate resolution for identified single failures.
 - a) There is justification of system adequacy despite the identified failure.
 - b) There is confirmation that proposed system modifications were made, as well as another FMEA.





SCOPE OF WORK - ELECTRICAL

1. Onsite Emergency AC Power System

The review of the Onsite Emergency AC Power System design will use the FSAR licensing commitments and design criteria to establish the acceptable limits for the system design. The following design calculations, one-line drawings, and procurement specifications will be reviewed in detail to ensure that the basic design criteria have been incorporated.

- a. Review of reserve station service transformer sizing calculation.
- b. The station service system calculations will be reviewed to determine if the adequate voltages are available at the motor terminals for the following load and operating conditions:
 - Minimum load with maximum 115-kV switchyard voltage.
 - Full load with minimum 115-kV switchyard voltage.
 - Worst case motor start condition with minimum 115-kV switchyard voltage.
- c. Review of voltage profiles at the emergency buses during a degraded 115-kV switchyard voltage condition. Review of emergency bus undervoltage relay trip set points to prevent degraded offsite sources from affecting operation of the system.
- d. Review of Class 1E diesel generator sizing calculation.
- e. Review of 4-kV and 600-V power cable sizing calculation for selected motor loads.
- f. 4-kV switchgear, load-center, MCC, motor, diesel generator, cable, etc, specifications will be reviewed to determine if the following requirements have been addressed:
 - Licensing commitments
 - Design criteria
 - Calculation results
 - Equipment qualification





g. Class 1E one-line drawings will be reviewed to determine if the following requirements have been included:

- Licensing commitments
- Design criteria
- Calculation results
- Redundancy

h. Selected Class 1E raceway layout drawings will be reviewed to determine if the following requirements have been addressed:

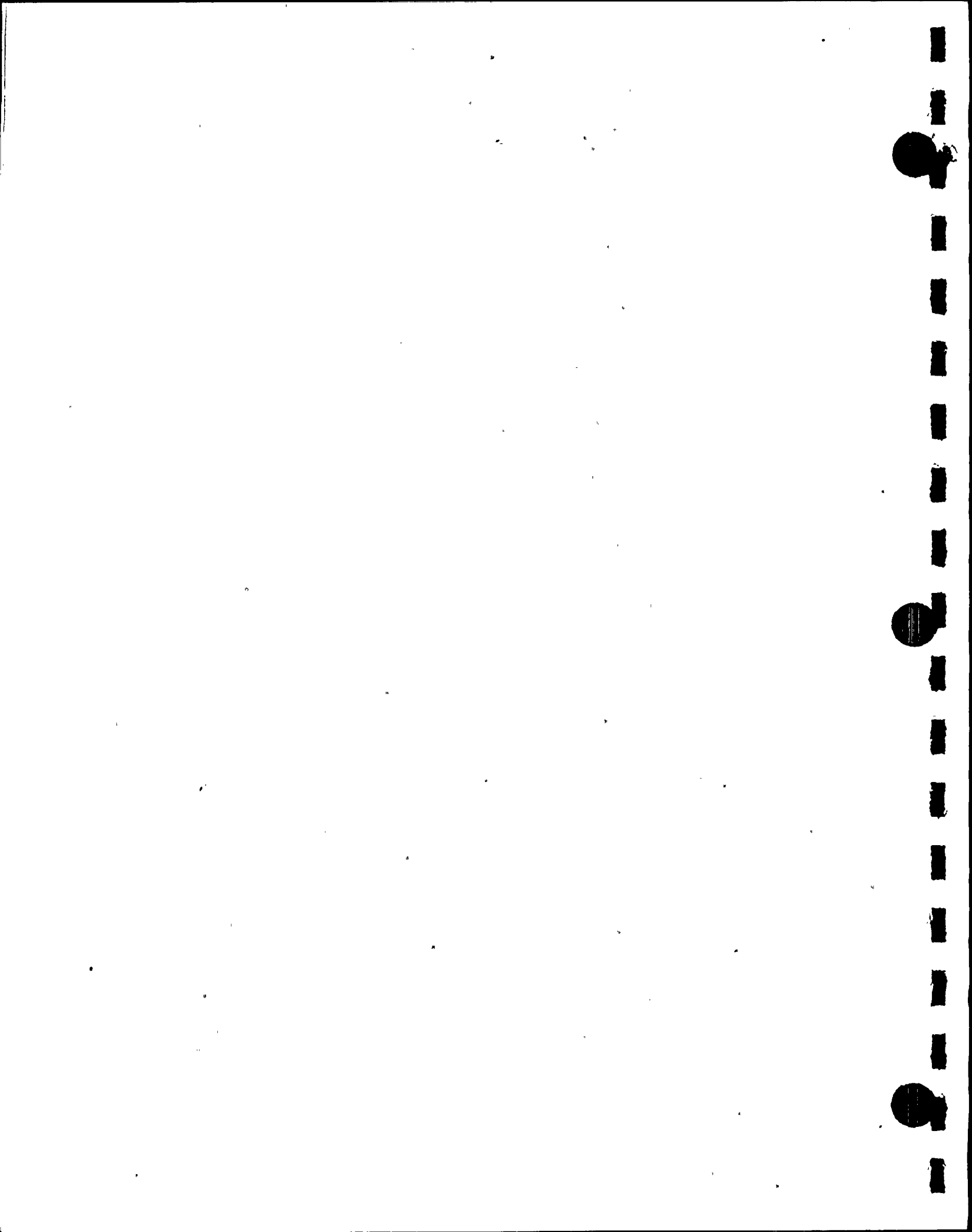
- Separation
- Licensing commitments
- Design criteria

2. Service Water System

The detailed calculations, procurement specifications, and construction documents will be reviewed to ensure that the system design is consistent with the design criteria and licensing commitments. This review will include the following:

- A review to verify that the appropriate equipment qualification environmental parameters, seismic requirements, and hydrodynamic load requirements have been included in procurement specification requirements.
- Separation and redundancy requirements.
- Impact of post-TMI requirements of NUREG-0737.
- Cable sizing calculations for the large motor feeds.
- Voltage profiles (at motor terminals) during full load and motor start conditions with minimum switchyard voltage.





SCOPE OF WORK - CONTROL SYSTEMS

The review of the Service Water System and the Onsite Emergency AC Power System will use the FSAR licensing commitments and design criteria. The basic methodology for performing the review will consist of the following tasks as defined for each system.

1. Service Water System

- Review of logic diagrams to confirm system operation for automatic and manual control as required during a LOCA and/or loss of offsite power.
- Review of applicable instrument loop/schematic diagrams for redundancy, separation, and operation.
- Review electrical elementary diagrams for instrumentation and control device redundancy, separation, and different modes of operation.
- Review of instrument and alarm set points for required system operation.
- Review the appropriate Equipment Qualification environmental parameters, seismic requirements, and operating durations have been included in procurement specification requirements.
- Review of selected calculations for instrument selection.
- Review of selected instrumentation specifications and data sheets for instrument selection.
- Review of indication provided for operator monitoring requirements.
- Review for compliance with post-TMI requirements of NUREG-0737.
- Review instrument location drawings and piping drawings for incorporation of required instruments.

2. Onsite Emergency AC Power System

- Review logic diagrams to confirm required load sequencing of diesel generators.





- Review of indication provided for operator monitoring.
- Review of applicable electrical elementary diagrams for control device redundancy and separation.





SCOPE OF WORK - ENGINEERING MECHANICS

The review shall include selected piping runs from Service Water Pump Bay (Division 1) to RHS heat exchanger and the piping in the vicinity of Diesel Generator cooler, a minimum number of pipe support and major component supports in the Service Water System and check for compliance with applicable FSAR licensing commitments and design criteria of ASME III, Code Classes 1, 2, and 3, and ANSI B31.1. The following areas will be included.

1. Design Input Control

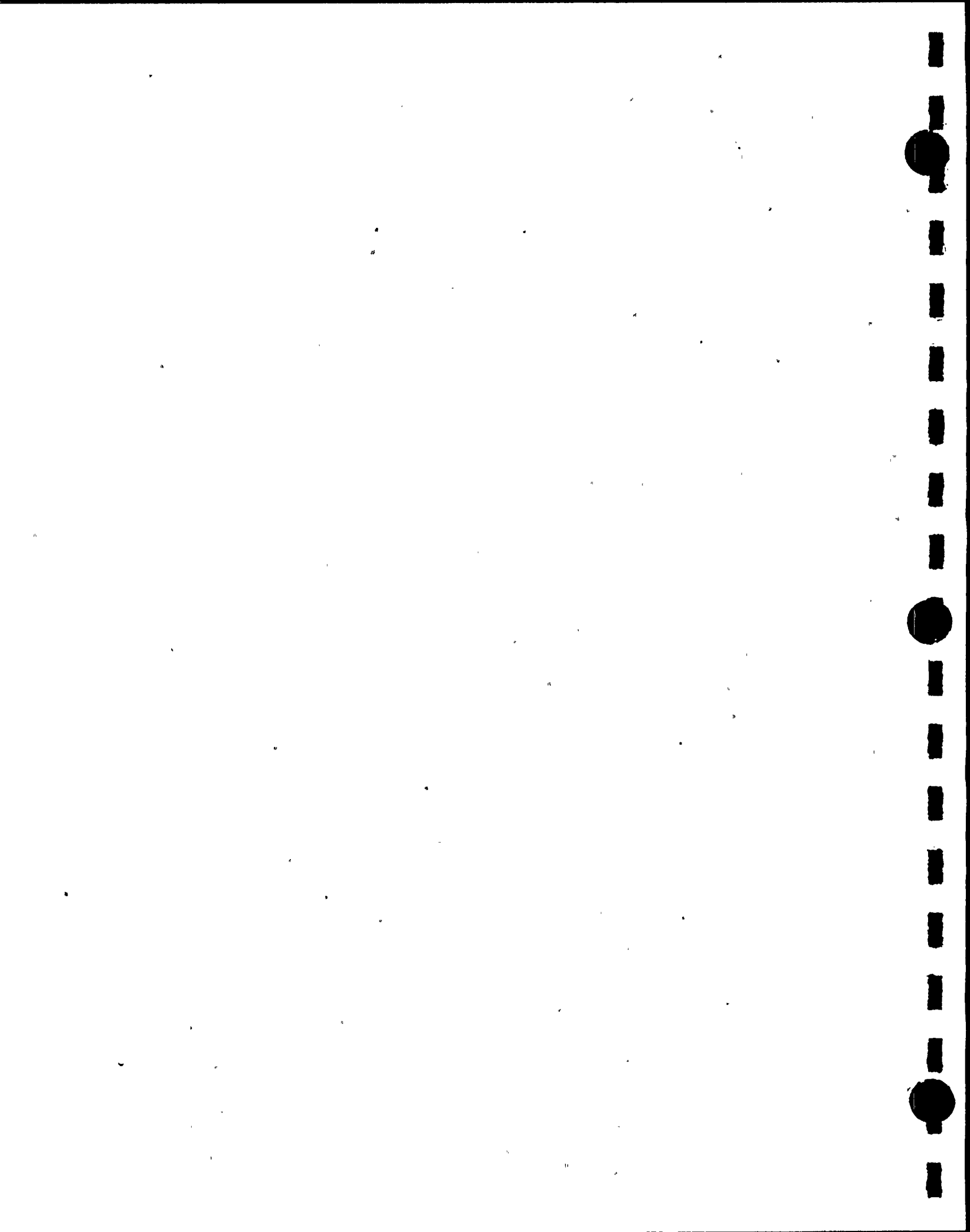
Review the implementation of project procedure(s) for latest revision status of ARS design information, pipe support drawings, and piping isometrics. This will determine if the updated design input information is distributed to the input user.

2. System Review

The review process will include the following areas:

- Review design criteria for pipe stress analysis.
- Review pipe stress analysis for the latest revision of design input, modeling technique, design loading cases, and maximum stresses.
- Review design criteria for pipe support designs.
- Review pipe support design for correct application of support design loads, loading orientation, load combinations, and pipe support location plan on final support drawings. A minimum number of pipe supports will be reviewed.
- Review design information and criteria for major equipment supports.
- Review the calculated safety/relief valve hydrodynamic loads.
- Review for adequate separation of safety-related system to counteract the effects of pipe whip, jet impingement, and missiles.





3. Input Information

The following are assumed to be correct and will be used as input information in performing the review.

- The design and operating parameters as specified in the Standard Line Designation Table of Piping Engineering and Design Specification, (P301A).
- The seismic Amplified Response Spectra (ARS) curves, ARS enveloped curves, and computer storage locations of their digitized data.
- The hydrodynamic ARS curves and computer storage locations of their digitized data.
- All postulated pipe break locations and sources of internally generated missiles.
- Pipe rupture restraints, jet impingement shields, and missile shields.





J.O. NO. 12177.73
STONE & WEBSTER ENGINEERING CORPORATION
NIAGARA MOHAWK POWER CORPORATION
NINE MILE POINT NUCLEAR STATION - UNIT 2
INDEPENDENT DESIGN REVIEW PROGRAM

Attachment 7.
Page 1 of 1

SCOPE OF WORK - STRUCTURAL

The structural review will include piping support embedments, cable tray and conduit supports and its embedments for the selected systems. The tasks include the following:

1. Review of criteria and analytical methods for determining the allowable loads on the various types of standard embedment plates.
2. Review of analyses of Category I cable tray supports.
3. Review of designs of Category I conduit supports.
4. Review the evaluation of structural adequacy of standard embedment plates to support selected piping and cable tray systems.
5. Review support designs of cable tray and conduit supports using drilled-in concrete anchors.
6. Computerized calculations will be reviewed for:
 - Design assumptions and analytical approach.
 - Modeling technique and computer code input.
 - Reasonable results.





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J.O.No. 12177.73

Review Project Procedure: RPP-5-0

Date: March 17, 1983

Page 1 of 3

Stone & Webster Engineering Corporation
Niagara Mohawk Power Corporation
Nine Mile Point Nuclear Station - Unit 2
Independent Design Review Program

PROJECT FILES

Albert A. Patterson
Review Project Engineer

3-17-83
Date

1.0 PURPOSE

- 1.1 This procedure provides instruction for the preparation and indexing of the Independent Review Project Job Books.

2.0 SCOPE

- 2.1 This procedure applies to all Job Books prepared and maintained for the Nine Mile Point Nuclear Station - Unit 2 Independent Review of Key Technical and Interface Concerns hereafter called the Independent Review.

3.0 PROCEDURE

3.1 General

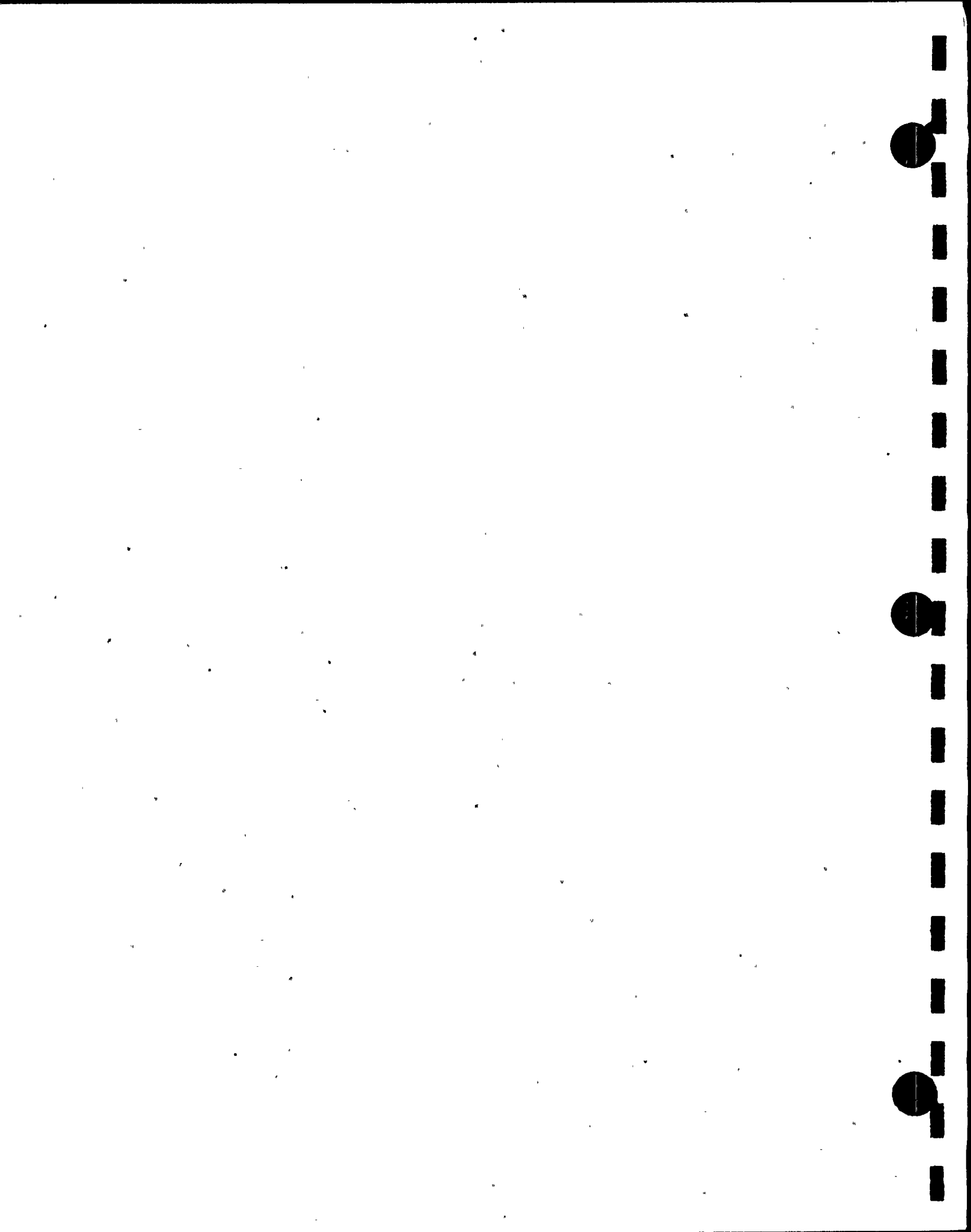
- 3.1.1 Project files for the Independent Review shall be organized into Job Books (see Attachment 1, Job Book Index). Job Books for this project shall be divided into two categories:

- Administrative Job Books which organize documents that control the administration of the project.
- Task Job Books which organize documents resulting from design review activities performed according to RPP-1-0.

- 3.1.2 As a minimum the Administrative Job Books shall contain the following:

- Job Authorization
- Project Procedures - All procedures needed to conduct the project activities
- Estimates and Costs - Engineering estimates and costs records





- Progress Reports - Progress reports and schedule updates
- Conferences - Notes of Conference and notes of telephone conversations
- Correspondence with NMPC
- Interoffice correspondence
- Reports - Review reports generated by the Review Team.

3.1.3 Task Job Books shall be subdivided into the following categories:

- Power
- Electrical
- Control Systems
- Engineering Mechanics
- Structural
- Interdiscipline Communication
- Equipment Qualification

3.1.4 Documents shall be filed by subject content in chronological order into the appropriate subdivisions of the corresponding Job Book.

3.1.5 The Job Books shall be prepared by attaching at the top of the spine of each book a label bearing the following identification data:

J.O.No.	_____
Project Name	_____
Client Name	_____
Job Book No.	_____
Title	_____

3.2 Job Book Number

3.2.1 The following numbering sequence applies to all Job Books:

$$\frac{X}{(1)} - \frac{X}{(2)}$$



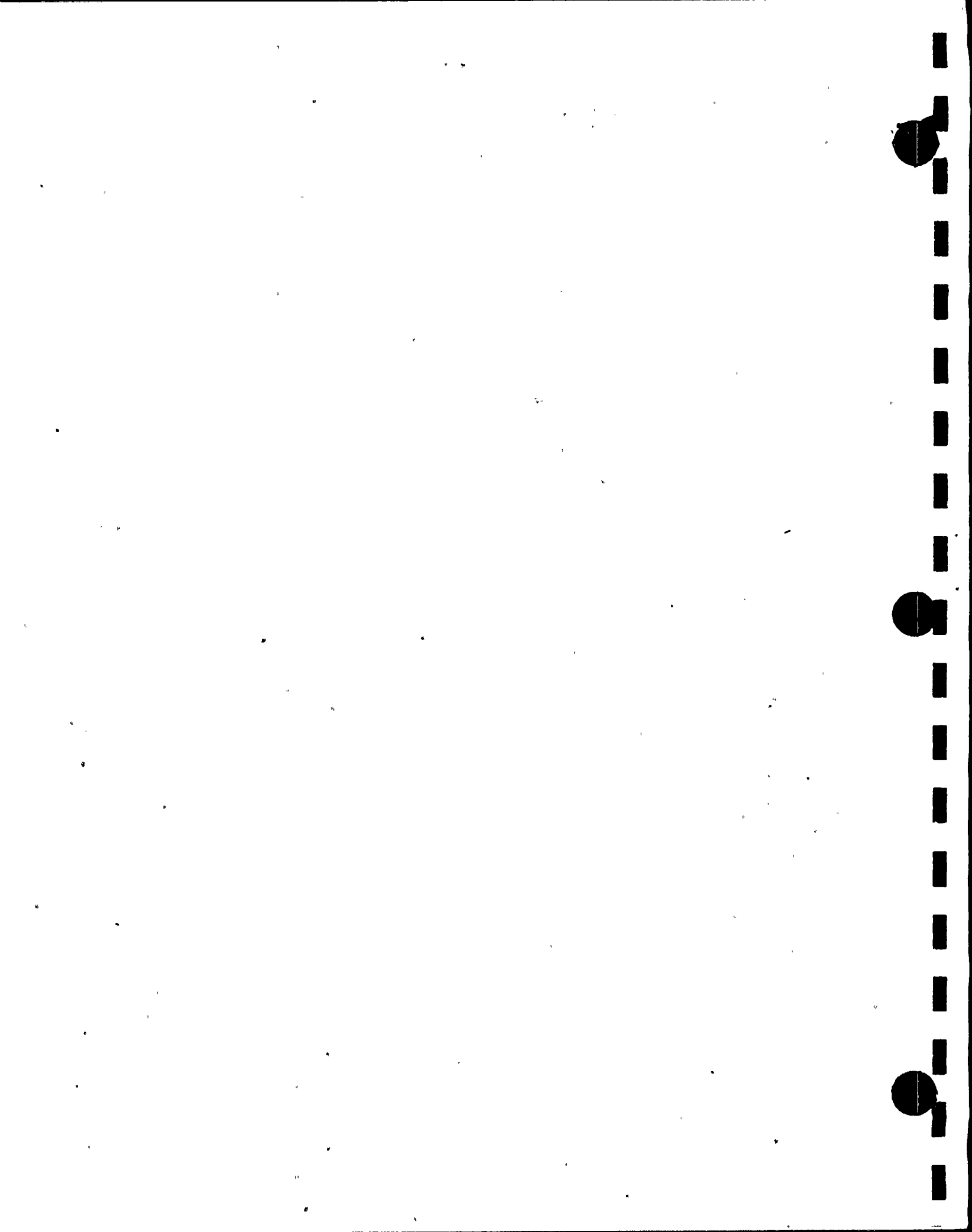


(1) Letters indicating Job Book categories:

A = Administrative
RP = Reference Power
RE = Reference Electrical
RC = Reference Control Systems
RN = Reference Engineering Mechanics
RS = Reference Structural
RF = Reference Construction.
P = Power
E = Electrical
C = Control Systems
N = Engineering Mechanics
S = Structural
F = Construction
I = Interdiscipline Communication
EQ = Equipment Qualification

(2) The volume number of multiple binders, containing the same subject, assigned in sequence as needed.





JOB BOOK INDEX

Job Book No.

A-1
P-1
E-1
C-1
N-1
S-1
I-1
EQ-1

Job Book Title

Administrative
Power Tasks
Electrical Tasks
Control Tasks
Engineering Mechanics Tasks
Structural Tasks
Interdiscipline Communication
Equipment Qualification





SWEC:70:83 83963:R.G.D:LLP
INTEROFFICE MEMORANDUM

▲ 040.28

SUBJECT QUALITY ASSURANCE AUDIT REPORT
REACTOR CONTROLS INC.
SAN JOSE, CALIFORNIA

TO G. M. Schierberg

J.O. OR
W.O. NO. 12210.50/12177.50

DATE September 12, 1983

FROM W. E. Bezanson

CC General Files
Chrono File
JHarrison/Audit File(2)
RJPalleschi/QIC File
RBKelly
RKMaxon
TJFitzgibbon
WHDarragh
WHGrieves
MGPace
JJZullo
EDiem
WMEifert(2)
JTPlant
PDGraham
TVaughn
FACanuso
CZappile
JAKirkebo
JDeMeo
KRMiller
RGDrummond.

NOTED SEP 12 1983 P.W.Day

THIS AUDIT APPLIES TO:

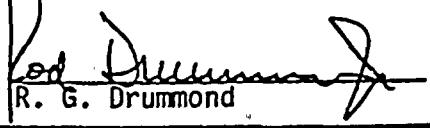
GULF STATES UTILITIES COMPANY - RIVER BEND STATION UNIT #1

NIAGARA MOHAWK POWER CORPORATION - NINE MILE POINT UNIT #2

STONE & WEBSTER ENGINEERING CORPORATION
PROCUREMENT QUALITY ASSURANCE DIVISION


T-381

AUDIT EVALUATION FORM

SUPPLIER AND LOCATION Reactor Controls Inc. 1245 South Winchester Boulevard San Jose, CA 95128	PREPARERS SIGNATURE  R. G. Drummond
MATERIAL MANUFACTURED AT FACILITY Engineering and Design of Piping Systems	DATE OF AUDIT August 9-11, 1983
AUDIT RESULTS OPEN - Pending Resolution of Corrective Action Items	ASME CERTIFICATES HELD CERTIFICATE NUMBER(S): NPT-N-1299 NA-N-1300
	CURRENT S & W CONTRACTS Gulf States Utilities Co. - 228.180-C285 Niagara Mohawk Power Corp. - NMP2-P301V

CORRECTIVE ACTION REQUIRED

YES - See Audit Summary

COMMENTS Completed audit checklists along with all back-up data are on file at the Stone & Webster Engineering Corporation, Procurement Quality Assurance Division, Boston, MA.	FUTURE ACTION DATE Fifteen(15) days after receipt of this report.
	APPROVED BY SIGNATURE 

QUALITY ASSURANCE AUDIT REPORT
 REACTOR CONTROLS, INC.
 SAN JOSE, CALIFORNIA

On August 9-11, 1983 Stone & Webster Engineering Corporation, Niagara Mohawk Power Corporation and Gulf States Utilities Company conducted a special Quality Assurance Audit at the San Jose, CA facility. The purpose of the audit was to verify Reactor Controls, Inc.'s compliance to their Quality Assurance Program, the applicable Stone & Webster specification requirements, and the intent of the following criteria of Appendix "B" to 10CFR50.

CRITERION III - DESIGN CONTROL

CRITERION VI - DOCUMENT CONTROL

NOTE: The audit was conducted at the request of the River Bend and Nine Mile Projects. The audit was mainly concentrated in the River Bend design and engineering area and included a review of areas common to both projects. However a review of the Nine Mile Project (RCI) engineering documents could not be performed since the responsible RCI personnel were not available.

PERSONNEL CONTACTED AND ASSISTING IN THE AUDIT WERE:

REACTOR CONTROLS, INC. PERSONNEL

*B. MacKellar	-	Project Engineer
*S. Schmukler	-	Lead Engineer
*L. Nishiguchi	-	Technical Manager
*J. Murray	-	Engineering and Construction Manager
*A. Mourad	-	Project Engineer
*D. Jasmann	-	Quality Assurance
*R. Weitenstein	-	River Bend Project Engineer
R. Crumm	-	Quality Assurance Manager
R. Chaudhari	-	Lead Engineer (Piping)

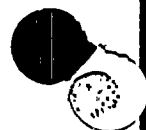
AUDIT TEAM PERSONNEL

*R.G. Drummond	-	Lead Auditor - SWEC/Boston
*W.C. Luong	-	Supervisor EMD - SWEC/CHOC
*T.Y. Chow	-	Supervisor EMD - SWEC/CHOC
M.J. Shah	-	Supervisor Structural Division - SWEC/CHOC
*T.S. Szabo	-	Lead Engineer

OBSERVERS

*C. Lambert	-	Supervisor, Gulf States Utilities
E. Zoch	-	Supervisor, Gulf States Utilities
*P. Francisco	-	QA Engineer, Niagara Mohawk Power Corporation

* Denotes attendees at exit critique.



AUDIT CONCLUSIONS

It is the conclusion of the audit team that Reactor Controls, Inc. is not complying with certain requirements of their Quality Assurance Program, the applicable Stone & Webster specification, and the referenced criteria of Appendix "B" to 10CFR50, in the areas audited as referenced below. However, the results of this audit indicate that shipments should not be stopped nor should a Stop Work Directive be issued.

AUDIT SUMMARY

This report contains observations which are not in compliance with established requirements, or were determined to be in need of improvement.

During the conduct of the audit, 57 attributes were checked, resulting in 32 observations, of which 5 were nonconforming.

NOTE: Those items identified with the prefix "CAI" require a written corrective action response. The item in Attachment "A" is a recommendation only and a written response is not required. The items in Attachments "B" and "C" require a written response from the responsible Stone & Webster Project Engineers.

CORRECTIVE ACTION AUDIT SUMMARY

The following observations reported by SWEC's Quality Assurance Corrective Action Audit of March 15-18, 1983 are closed as a result of this audit based on the completion of RCI's corrective action.

CAI-1 and CAI-2.

NOTE: Stone & Webster's audit report dated April 4, 1983 is now considered closed.

CRITERION VI - DOCUMENT CONTROL

CAI-1 Appendix B to 10CFR50 and RCI's Quality Assurance Instructions (Section 3) contain requirements for control of incoming documents.

A sample of eight documents sent to RCI by SWEC, which were the last entries in the RCI incoming correspondence log, was reviewed to determine compliance to RCI Procedure requirements. The following is the result:

Seven of the eight transmittals had problems.

- a. Three of the four documents required to be entered in the Document Control System for action by RCI, were not entered.
- b. Although the procedures do not specify a time limitation for the initial review, most of the reviews were done in 3 to 5 days. Four of the eight have not been reviewed to date although two were received in May, 1983, one in June and one in July.



CRITERION VI - DOCUMENT CONTROL
CAI-1 (Cont.)

RECOMMENDATION

Provide compliance to procedural requirements. Also, update procedures to include a time limitation for the completion of RCI's review of future document submittals.

CRITERION III - DESIGN CONTROL

CAI-2 Specification 12210 - 282.180, Page 1-70, Lines 56.49 and 58.11 require RCI drawings, isometrics, and sketches contain specified minimum information.

None of the drawings, isometrics and sketches reviewed during the audit contained all of the required information.

Examples of missing information are:

1. Job numbers
2. Contract or specification numbers
3. SWEC line designation numbers
4. Reference drawings and revisions
5. Spool piece mark numbers
6. Material lists

RECOMMENDATION

Provide compliance with specification requirements or obtain a specification change from the SWEC Project.

CRITERION III - DESIGN CONTROL

CAI-3 Specification 12210 - 228.180, Page 1-4, Line 4.47 requires that traveler-type documents shall incorporate quality assurance checkpoints on fabrication and erection records.

Presently, the ANI indicates on the Weld Data Sheets where he wants "inspection hold points" established. However, the Weld Data Sheets are not used in the fabrication process.

RCI procedures do not define how these hold points are transmitted to the fabrication area and objective evidence was not presented to indicate RCI's contention that hold points are established on the spool piece sketches.

RECOMMENDATION

Expand the procedures to define how inspection hold points are transferred to traveler type documents for use in the fabrication area.

CRITERION III - DESIGN CONTROL

CAI-4 RCI's Quality Assurance Instruction (QAI's) 3-5, Section 5.2.2 states that "Calculation source of input data, factors, equations and codes shall be identified and referenced as necessary to provide positive traceability".

CRITERION VI - DOCUMENT CONTROL
CAI-4 (Cont.)

Contrary to these requirements, the sources of many of the input values contained in the reviewed calculations were not identified.

In addition, the calculations reviewed were not finalized to create a formal record (i.e., a signed out calculation revision) in support of current issued RCI design drawings.

RECOMMENDATION

Provide compliance with the requirements of QAI 3-5, Section 5.2.2.

Calculations must be finalized to provide a formal record of the calculation contents which supports RCI design documents.

CRITERION III - DESIGN CONTROL

CAI-5 RCI procedures PC-1 and PC-2 (pipe clamp standards for welded U type and friction type pipe clamps) do not have test results or design analysis to provide assurance that the design bases are adequate for the River Bend Project.

RECOMMENDATION

Provide the design bases either by test or design analysis to assure adequate design for these and all other standards used on SWEC projects.



ATTACHMENT "A"

CRITERION III - DESIGN CONTROL

R-1

RCI's Quality Assurance Manual, Section 2 requires the fabrication and erection areas to control the use of ECNs (Engineering Change Notices).

Neither the RCI QA manual nor RCI implementing procedures establish requirements for the control, use and incorporation of ECNs into the effected documents by engineering and design.

RECOMMENDATION

The RCI QA program should be updated to establish requirements for control, use and incorporation of ECNs by engineering and design.

CRITERION III - DESIGN CONTROL

R-2

RCI procedure PC-1 (pipe clamp standard for welded U type clamps) lists a tolerance of 7/64" for dimension "C" on attachment A of the procedure. This tolerance appears to be excessive for 1/2" diameter pipe and could cause potential problems during construction.

RCI drawing RB-010, Rev. 1 for multi-function supports lists a dimensional tolerance (generic on all structures) of 1/2". This tolerance appears to be too restrictive and may cause unreasonable construction problems.

RECOMMENDATION

It is recommended that a tolerance of 5/64" be listed on Attachment A to PC-1 for 1/2" pipe and that less critical tolerances be considered for all other pipe sizes listed on this procedure.

Reconsider the 1/2" generic tolerance and set more reasonable tolerances.



ATTACHMENT B

CRITERION III - DESIGN CONTROL

R-3

As requested by the River Bend Project, EA performed an audit of RCI. Engineering Assurance has concluded the following as part of that audit:

1. River Bend Specification 12210.228-180, page 1-6, as modified by E&DCR P-12,136 correctly reflects that RCI is an "NPT" certificate holder (fabricator of piping subassemblies and piping supports) and an "NA" certificate holder (installer). The specification also correctly assigns RCI responsibility to complete NPP-1 and NF-1 Data Reports in their entirety based on their "NPT" certificate. However, the specification was found to be incorrect or missing information in relation to ASME III requirements as follows:
 - A. Page 1-6, item 27 incorrectly requires RCI to fill out and sign "N-5" forms completely based on their "NA" certificate. As "NA" certificate holder, RCI can only complete the installation portion of N-5 Data Reports. As "N" certificate holder, SWEC must complete the final portion of "N-5" Data Reports.
 - B. The specification does not identify for interface purposes that SWEC is the "N" certificate holder having overall design responsibility for the piping system being fabricated and installed by RCI.
 - C. The specification does not establish interface requirements between RCI and SWEC relative to the joint completion of the "N-5" Data Reports or identify the RCI design documents that require detailed technical review by SWEC as a basis for certifications as "N" certificate holder.

NOTE: Current SWEC reviews of RCI documents "for interface requirements only" as indicated by the definitions of "Approved" and "Approved as Revised" in the specification are not sufficient for this purpose.

RECOMMENDATION

Revise the specification to:

- o Identify SWEC responsibilities as "N" certificate holder.
- o Establish requirements for joint completion of "N-5" Data Reports by RCI and SWEC.

ATTACHMENT B (Cont.)

CRITERION III - DESIGN CONTROL

R-3 (Cont.)

Recommendation (Cont.)

- o Identify the RCI design documents that shall be submitted to SWEC for detailed technical review as a basis for SWEC certifications as "N" certificate holder. Typical examples of these design documents include stress analysis, stress reports, drawings (design and as-built), load capacity data sheets, etc. Establish submittal schedules with consideration for fabrication and installation status.

Develop Project Procedures for the detailed review of RCI documents that establish the extent of review required, methods of documenting SWEC approvals, and logging systems that relate the documents reviewed and approved to the N-5 Data Reports to be approved by SWEC as "N" certificate holder.

ACTION ASSIGNED:

JAKirkebo



ATTACHMENT C

CRITERION III - DESIGN CONTROL

As requested by the Nine Mile project Engineering Assurance as part of the RCI audit has reviewed the responsibility for "N" stamp certification and offers the following conclusions:

R-4

1. Nine Mile 2 specification 12177-MNP2-P301V, was found to be incorrect or missing information in relation to ASME III requirements as follows:

- A. The specification (page 1-11) incorrectly indicates that RCI is an "N" certificate holder. RCI is an "NPT" certificate holder (fabricator of piping subassemblies and piping supports) and an "NA" certificate holder (installer). SWEC is the "N" certificate holder having overall design responsibility for the piping system being fabricated and installed by RCI.

- B. Page 1-11, item 13 incorrectly requires RCI to fill out and sign "N-5" forms completely. As "NA" certificate holder, RCI can only complete the installation portion of N-5 Data Reports. As "N" certificate holder, SWEC must complete the final portion of "N-5" Data Reports.

NOTE: Based on their "NPT" certificate, RCI can complete NPP-1 and NF-1 Data Reports in their entirety.

- C. The specification does not establish interface requirements between RCI and SWEC relative to the joint completion of the "N-5" Data Reports or identify the RCI design documents that require detailed technical review by SWEC as a basis for certifications as "N" certificate holder.

NOTE: Current SWEC reviews of RCI documents "for interface requirements only" as indicated by the definitions of "Approved" and "Approved as Revised" in the specification are not sufficient for this purpose.

RECOMMENDATION

Revise the specification to:

- o Identify RCI responsibilities as "NA" and "NPT" certificate holder.
- o Identify SWEC responsibilities as "N" certificate holder.
- o Establish requirements for joint completion of "N-5" Data Reports by RCI and SWEC.



ATTACHMENT C (Cont.)

CRITERION III - DESIGN CONTROL
R-4 (Cont.)
Recommendation (Cont.)

- o Identify the RCI design documents that shall be submitted to SWEC for detailed technical review as a basis for SWEC certifications as "N" certificate holder. Typical examples of these design documents include stress analysis, stress reports, drawings (design and as-built), load capacity data sheets, etc. Establish submittal schedules with consideration for fabrication and installation status.

Develop Project Procedures for the detailed review of RCI documents that establish the extent of review required, methods of documenting SWEC approvals, and logging systems that relate the documents reviewed and approved to the N-5 Data Reports to be approved by SWEC as "N" certificate holder.

ACTION ASSIGNED:

C. Zappile, Jr.



Mr. J. Murray
Engineering & Construction Manager
Reactor Controls Inc.
1245 South Winchester Boulevard
San Jose, CA 95128

September 12, 1983

12210.50/12177.50

QUALITY ASSURANCE AUDIT REPORT
REACTOR CONTROLS INC.

Transmitted herewith are the results of the audit conducted at your facility on August 9-11, 1983.

You are requested to review this report and submit your comments on the corrective action items within fifteen(15) days of receipt, stating the action which has been taken by you, and the date when full compliance will be achieved. Your response should include a description of action (to be) taken to prevent recurrence of these deficiencies.

At this time, I wish to thank you and your staff for the courtesy and cooperation extended to our representatives.

ORIGINAL SIGNED

G. M. Schierberg
Manager
Procurement Quality Assurance

Enclosures

RGD:LLP





STONE & WEBSTER ENGINEERING CORPORATION

AUDIT PLAN

TITLE:

SPECIAL AUDIT OF REACTOR CONTROLS INC. of SAN JOSE, CALIF.

AUDIT PLAN NO.:

RCI-1-A

PREPARED BY:

R. G. Drummond Jr.

REVISION:

0

DATE:

8-1-83

APPROVED BY:

F. J. Qualter *FR*

- Supervisor, PQA

PAGE 1 OF 2

1.0 PURPOSE

To determine compliance by Reactor Controls Inc. to the requirements of their Quality Assurance Manual and the applicable Stone & Webster specification(s).

2.0 REFERENCES

2.1 Reactor Controls Inc., Quality Assurance Manual, Revision 8, dated 4-21-83

2.2 Stone & Webster's specifications

2.2.1 12210. 228. 180

2.2.2 12177. NMP2-P301V

3.0 PROCEDURE

3.1 The audit shall be performed in accordance with the following instructions:

3.1.1 Review all referenced documents.

3.1.2 Complete the attribute sheets by entering all the required information during the audit.

3.1.3 Add any additional attributes as required during the audit.

- 3.2 To verify the attribute "Are the procedures adequate to assure control of the system" (usually written as the last attribute in each section), examine each unsat condition and determine if the condition is a result of a procedure inadequacy.
- 3.3 The attached sampling plan (Attachment 3.1) QAD 7.11 as applicable shall be used to perform this audit.
- 3.4 All attributes not answered for any reason shall be marked NA (Not Auditable) and the reason given in the comments column.
- 3.5 Verify the program being audited also covers those components or parts which are nonpressure boundaries as defined by ASME Section III.

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
1.	Verify that traveler type documents incorporate quality assurance check points. 228.180 page 1-4 line 4.47				
2.	Verify that RCI has received from the Engineers a "Release for Fabrication." 228.180 page 1-9 line 8.44				
3.	In cases where conflicts exist between specification requirements and piping drawings, has RCI reported in writing to the Engineers for disposition? 228.180 page 1-15 line 14.35				



AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
4.	<p>Verify that if RCI's drawings do not conform to SWEC drawing 12210-EP-87, written approval has been requested by RCI.</p> <p>228.180 page 1-15 line 14.38</p>				
5.	<p>Verify that RCI has submitted to the Engineers the stress report which includes:</p> <ul style="list-style-type: none"> a. description of the input b. procedures of analysis c. calculations d. final stress summary e. equipment loading results f. support loadings g. corresponding designs <p>228.180 page 1-18 line 17.4</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
6.	<p>Verify that prior to fabrication RCI will submit to the Engineers their shop bending procedures.</p> <p>a. Does the procedures include the requirement that the longitudinal seam is to be located on the neutral axis of the bend?</p> <p>228.180 page 1-22 line 20.7</p>				
7.	<p>Verify that RCI isometric drawings include the following:</p> <p>A. 1. Contract No. (RBS-228.180) J.O. No. 12210 River Bend Station - Unit 1 Gulf States Utilities Company West Feliciana Parish, Louisiana</p> <p>B. Reference drawing number and revision number.</p> <p>C. Spool piece mark numbers.</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	<p>D. Location and identification of all field welds. Location and identification of all shop welds which require inservice inspection. (Unique identification shall be SWEC's or RCI's)</p> <p>E. Line designation and component - mark number.</p> <p>F. Fabrication dimensions.</p> <p>G. Material List.</p> <p>228.180 page 1-70 lines 56.49</p>				
8.	<p>Verify that hanger assembly sketches contains the following:</p> <p>A. All support locations with support identification numbers, individually located dimensionally with reference to structural steel column lines and radially from the center of circular structures.</p> <p>B. Existing steel marked "existing".</p> <p>C. Additional supplementary steel marked "new".</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	<p>D. Spring hangers sketches shall include spring figure number, type, size, normal working load, setting for hot and cold positions and pipe movement.</p> <p>E. Bill of materials.</p> <p>228.180 page 1-70 line 58.11</p>				
9.	<p>Verify that subcontractors that provide services to RCI have been approved by the Engineers.</p> <p>- Has RCI imposed upon these subcontractors the same requirements that have been imposed upon them by the SWEC specification (as appropriate).</p> <p>228.180 page 1-73 line 61.2</p>				
10.	<p>Verify that RCI has procedures for the preparation, approval and control of both manual and computer calculations.</p> <p>(General)</p>				



AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	<p><u>GENERAL</u> (Project Requested)</p> <p>1. Verify that RCI has a formal program for the following:</p> <p style="margin-left: 40px;">a. A method of controlling and incorporating changes to RCI engineering and design documents generated by:</p> <p style="margin-left: 80px;">1. Stone & Webster (external)</p> <p style="margin-left: 80px;">2. Reactor Controls (internal)</p> <p>(General)</p> <p>2. Verify that computer program verification basis is fully documented.</p> <p style="margin-left: 40px;">- Is the RCI computer program verification procedure being fully implemented.</p> <p>(General)</p>				



AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
3.	Select several computer programs utilized by RCI for SWEC projects, and review the documentation and basis for the verification of each program.				
	<u>PIPE SUPPORTS</u> - (Project Requested)				
1.	Select a sample of various clamp drawings and evaluate each of the designs.				
2.	Select a sample of pipe support drawings and check to see what effect the stated tolerances may have on the design.				
3.	Review methodology of generating loads resulting from water hammer, jet impingement and pipe rupture.				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
4.	<p>Review details of the mathematical models, loads, computer programs, methods of analysis, assumptions, load combinations and compliance to code requirements. (ASME III NF Section)</p> <p><u>PIPE STRESS</u> - (Project Requested)</p> <p>1. Select a number of representative pipe stress problems and review the basis of the analytical detail.</p> <p>2. Review a sample of pipe stress problem models, input loads, computer programs used, methods of analysis, assumptions, load combinations and the analytical results.</p> <p>3. Review compliance to code requirements (ASME III and ANSI) for stress.</p>				

SWEC:19:84

.84333:RD:AEK

INTEROFFICE MEMORANDUM

▲ 040.28

SUBJECT QUALITY ASSURANCE AUDIT REPORT
REACTOR CONTROLS INC. (RCI)
SAN JOSE, CA

J.O. OR 12210.50/12177.50
W.O. NO.

DATE March 21, 1984

FROM WEBezanson

TO

G. M. Schierberg

CC General Files
Chrono File
JHarrison/Audit File(2)
RJPalleschi/QIC File
RBKelly
RKMaxon
TJFitzgibbon
WHDarragh
WHGrieves
JEHuston
MGPace
JJZullo
EDiem
WMEifert(3)
JTPlant
TCrouse
TVaughn
FACanuso
JAKirkebo
CZappile
MYeming
WWhitten
KRMiller
GFoley
RGDrummond:jmm

THIS AUDIT APPLIES TO:

GULF STATES UTILITIES COMPANY - RIVER BEND STATION UNIT #1

NIAGARA MOHAWK POWER CORPORATION - NINE MILE POINT UNIT #2

STONE & WEBSTER ENGINEERING CORPORATION
PROCUREMENT QUALITY ASSURANCE DIVISION

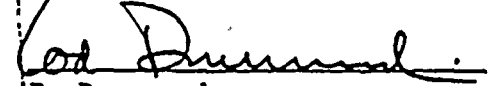
T-381A

AUDIT EVALUATION FORM

SUPPLIER AND LOCATION

Reactor Controls Inc.
1245 So. Winchester Blvd.
San Jose, CA 95128

PREPARERS' SIGNATURE


R. Drummond

MATERIAL MANUFACTURED AT FACILITY

Control Rod Drive Piping

DATE OF AUDIT

January 24-26, 1984

AUDIT RESULTS

OPEN - Pending Resolution of Corrective Action
Items

ASME CERTIFICATES HELD
CERTIFICATE NUMBER(S):

NONE (For Engineering and Design)

CURRENT SWEC CONTRACTS

Gulf States Utilities Co. -
228.180 - C285

Niagara Mohawk Power Corp.
P-301V

CORRECTIVE ACTION REQUIRED

YES - See Audit Summary

COMMENTS

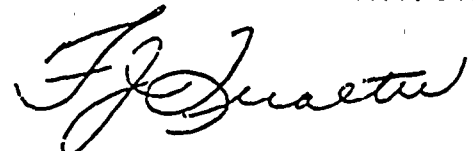
Completed audit checklists along with all back-up data
are on file at the Stone & Webster Engineering
Corporation, Procurement Quality Assurance Division,
Boston, MA.

This report also closes the following observations
CAI-1, CAI-3, and CAI-5 identified in the previous
Stone & Webster audit report dated Sept. 12, 1983,
however CAI's 2 and 4 remain open pending resolution
by RCI.

FUTURE ACTION DATE

Thirty (30) days after
receipt of this report.

APPROVED BY SIGNATURE



QUALITY ASSURANCE AUDIT REPORT
REACTOR CONTROLS INC.
SAN JOSE, CALIFORNIA

On January 24-26, 1984, Stone & Webster Engineering Corporation and Niagara Mohawk Power Corporation conducted a Quality Assurance Audit at the San Jose, California, facility. The purpose of the audit was to verify Reactor Controls, Inc.'s compliance to their Quality Assurance Program, the applicable Stone & Webster specification requirements, and the intent of the following criteria of Appendix "B" to 10CFR50.

CRITERION III - DESIGN CONTROL

CRITERION IV - PROCUREMENT DOCUMENT CONTROL

CRITERION VII - CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES

CRITERION XVIII - AUDITS

NOTE: This was a limited scope audit to cover only those criteria identified above.

PERSONNEL CONTACTED AND ASSISTING IN THE AUDIT WERE:

REACTOR CONTROL, INC. PERSONNEL

*Robert Crum	- Quality Assurance Manager
*D. Jasmann	- Quality Assurance Specialist
F. R. Seddiqui	- Technical Manager
*J. C. Murray	- Engineering and Construction Manager RBP
*A. Secchi	- Engineering and Construction Manager NMP
L. J. Nishiguchi	- Manager Structural Mechanics
*A. S. Nelson	- Project Manager NMP
B. I. Smith	- Assistant Project Engineer NMP
*A. Mourad	- Analysis Project Engineer RBP
R. Martin	- Pipe Rupture Lead Engineer
*R. Weitenstein	- Project Manager RBP
*S. Schmukler	- Lead Engineer
*D. Chaudhari	- Lead Engineer
*V. M. Durvasula	- Project Engineer NMP

STONE & WEBSTER AUDIT TEAM PERSONNEL

*R. G. Drummond	- Lead Auditor
*G. J. Foley	- Auditor
W. C. Luong	- Supervisor EMD Pipe Support
*T. Y. Chow	- Section Manager
*A. Tewfit	- Resident NMP
*S. M. Malhotra	- Coordinator RBP

OBSERVER

*P. E. Francisco	- N.M. Quality Assurance Engineer
*T. S. Szabo	- Lead Nuclear Technical Engineer RBP
*E. Epstien	- Responsible Engineer NMP

*Denotes attendees at exit critique.

AUDIT CONCLUSIONS

It is the conclusion of the audit team that Reactor Controls, Inc. is not complying with certain requirements of their Quality Assurance Program, the applicable Stone & Webster specification, and the referenced criteria of Appendix "B" to 10CFR50, in the areas audited. However, the results of this audit indicate that shipments should not be stopped nor should a Stop Work Directive be issued.

AUDIT SUMMARY

This report contains observations which are not in compliance with established requirements, or were determined to be in need of improvement.

During the conduct of the audit 66 attributes were checked, resulting in 801 observations, of which 5 were nonconforming.

NOTE: The item identified with the prefix "CAI" requires a written corrective action response. Those items in Attachment "A" are recommendations, however, a written response is required.

CRITERION IV

- PROCUREMENT DOCUMENT CONTROL

CAI-1

Reactor Control Purchase Order No. 11206-01 (NMP) issued to Sandvik Steel, Inc. dated June 25, 1982 invoked the requirements of Reactor Control's Procedure MS-1, Rev. 2, dated July 22, 1982, for the controls of manufacturing materials to ASTM A312 and SA 312 Class 1 pipe. Procedure MS-1 states in part that "for each heat the supplier shall perform a cold bend 90 deg to a radius of 50 in. for 3 in. thick stainless steel pipe."

Contrary to the above requirement, Reactor Control TWX dated July 12, 1982 to the manufacturer stated that the "3 in. thick stainless steel pipe does not have to be bent as required. (Note: no addition to the purchase order was issued for review by project and Engineering Assurance for acceptance to the change in the purchase order requirement).

RECOMMENDATION

Comply with the applicable Quality Assurance Procedure and applicable code/specification requirements.

CRITERIONS III & V

- CRITERION V OF APPENDIX B

CAI-2

Criterion V of Appendix B to 10CFR50 states that "Activities affecting quality shall be prescribed by documented instructions, procedures etc."

RCI recently revised their design procedures dealing with calculations, and in doing so they left out the following controls concerning calculations.

- a. Calculation format and page numbering
- b. Revising calculations
- c. Definition and responsibility of third signature
- d. Definition of "Open Item" system including close out method
- e. Other areas previously described in the revised/deleted procedures.

RECOMMENDATION

Initiate new procedures to cover the above.

NOTE: At the conclusion of the audit a "DRAFT" procedure was provided to the audit team, however, it did not address all of the above items.

CRITERION XVIII

- APPENDIX B

CAI-3

Appendix B 10CFR50 requires an audit system to verify compliance with all aspects of the Quality Assurance Program. Audit results shall be reported to management and corrective action taken in a timely manner.

Internal audit of engineering (Report No. 83-02-01) conducted April 11, 1983 listed five observations or findings (unverified computer programs, use of calculations not yet reviewed and approved etc). The report was issued and a response from the project was requested by May 26, 1983. Every 30 days thereafter a notice of later response was sent to the project by QA.

The project did not respond until September 1983, almost five months later. This appears to be an unreasonable amount of time taken by the project to respond to a report of deficiencies.

RECOMMENDATION

1. It is recommended that the RCI Quality Assurance Program include a standard time for responding to audit deficiencies.
2. In the future it is suggested that QA take further action in order to receive response in a more timely manner. (As presently allowed by the RCI QA Program.)
3. RCI Management should take appropriate action to ensure Project personnel respond in a more timely manner to audit deficiencies.

CORRECTIVE ACTION AUDIT SUMMARY

The following corrective action items of the audit conducted on August 9-11, 1983 were satisfactorily verified and are considered closed:

CAI-1, CAI-3, CAI-5, R-3, and R-4

The following corrective action items remain open pending further action:

CAI-2 and CAI-4

These items are identified in this report by their original CAI numbers followed by the letter "U."

With the incorporation of the open corrective action items in this report, the audit of August 9-11, 1983 is now considered closed.

OPEN ITEMS FROM THE AUGUST 9-11, 1983 AUDIT (RCI)

CRITERION III

- DESIGN CONTROL

CAI-2(U)

Specification 12210 - 282.180, Page 1-70, Lines 56.49 and 58.11 require RCI drawings, isometrics, and sketches contain specified minimum information.

None of the drawings, isometrics, and sketches reviewed during the audit contained all of the required information.

Examples of missing information are:

1. Job numbers
2. Contract or specification numbers
3. SWEC line designation numbers
4. Reference drawings and revisions
5. Spool piece mark numbers
6. Material lists

RECOMMENDATION

Provide compliance with specification requirements or obtain a specification change from the SWEC Project.

RCI'S RESPONSE, DATED OCTOBER 13, 1983 AND CORRECTIVE ACTION RESULTS

RCI had requested a change to the specification.

SWEC'S RESPONSE DATED OCTOBER 31, 1983

Response satisfactory - to be verified during future audit.

CORRECTIVE ACTION AUDIT RESULTS

The corrective action audit indicated a change to the specification had been issued. However, the change did not include all documents listed in the specification.

RECOMMENDATION

RCI should resubmit the request asking changes to the specification for all listed documents to waive the requirements.

CRITERION III

- DESIGN CONTROL

CAI-4(U)

RCI's Quality Assurance Instruction (QAI's) 3-5, Section 5.2.2 states that "Calculation source of input data, factors, equations, and codes shall be identified and referenced as necessary to provide positive traceability."

Contrary to these requirements, the sources of many of the input values contained in the reviewed calculations were not identified.

RECOMMENDATION

Provide compliance with the requirements of QAI 3-5, Section 5.2.2.

NOTE: The above QAI 3-5 has recently been revised. A draft replacement was provided to the audit team. Compliance to the new requirements will be audited at some future audit.

RCI'S RESPONSE DATED OCTOBER 13, 1983 AND CORRECTIVE ACTION RESULTS

RCI had committed to a complete review and update of all their final design calculations by February 1, 1984.

SWEC'S RESPONSE DATED OCTOBER 31, 1983

Response is satisfactory - to be verified during future audit.

CORRECTIVE ACTION AUDIT RESULTS

RCI had updated many of the final design calculations, however, the review and update was not complete. In addition, RCI has recently revised the 3.5 section of their QA Program. Several omissions were noted in the new procedures and RCI has verbally agreed during the audit to revise the procedures to include all past calculation requirements.

RECOMMENDATION

RCI must complete the revising of the 3.5 section of their QA Program to include all calculation requirements missing from original procedures.

When this is complete a review and update must be conducted of all calculations used in the final designs issued to date.

CLOSED ITEMS FROM PREVIOUS AUDIT

CAI-1

A reivev of current documentation belonging in the RCI Document Control System indicated that the system was being maintained up-to-date. In addition, a training session has been conducted on the Document Control System.

CAI-3

A procedure for the incorporation of "Hold points" on the "Shop Traveler Type Document" has been issued.

(PQA has been requested to review the traveler documents at the fabrication facility during the next audit conducted in 1984.)



CAI-5

Backup data has been assembled and kept as backup data for RCI clamp standards PC-1 and PC-2.

R-3

Specification P301V has been changed by issuance of E&DCR P-12,443 which changes responsibility for the "N" certification from RCI to SWEC.

In addition, the project has sent EA for review, a project procedure that defines SWEC project responsibility for the "N" certification.

R-4

Specification 228.180-C285 has been changed by issuance of E&DCR No. P-12,555 which changes responsibility for the "N" certification from RCI to SWEC.

In addition, the project has issued procedure RBP-3.10-0 that defines SWEC project responsibility for the "N" certification.

NOTE: In regard to R-3 and R-4 above, SWEC has assigned an engineer on a full time basis for each project at RCI's facilities for review and surveillance of design activities.



ATTACHMENT A

RECOMMENDATIONS

CRITERIA III - DESIGN (TECHNICAL PORTION OF AUDIT)

R-1 Design document SA-932-DAO, Rev. 4 for the GSU project lists an Appendix D entitled "Verification Descriptions of Computer Programs used on the GSU."

This document does not list all the computer programs used on the GSU project. Examples: E-Weld, E-2A17, E-Plate, SPECTRA, etc.

Revise SA-932-DAO to include all computer programs used on the GSU project.

R-2 Design document SA-4029 dated February 17, 1983 is complete, however, the code required equations have not been completed.

Revise the design document to include the complete code required equation.

R-3 Design document SA-932-DAO does not have the referenced Appendices C&D attached to the document nor does it refer to where copies of the appendices can be obtained.

Attach copies of all appendices to the document or insert a reference noting the location of all referred appendices if the document is too voluminous.

R-4 Computer output is not attached to most of the design documents done for stress because of the volume of that output.

RCI should consider using microfilm or microfiche to attach computer output to the particular design document.

R-5 Calculation results are being used in final design yet the third "approved" signature has not been signed to the calculation cover sheet.

Calculation results must not be used for any purpose until all approvals have been accomplished.

Mr. Robert Crum
Quality Assurance Manager
Reactor Controls, Inc.
1245 So. Winchester Blvd
San Jose, CA 95128

March 21, 1984

J.O.Nos. 12210.50/12177.50

QUALITY ASSURANCE AUDIT REPORT
REACTOR CONTROLS, INC.

Transmitted herewith are the results of the audit conducted at your facility on January 24-26, 1984.

You are requested to review this report and submit your comments on the corrective action items and recommendations within thirty (30) days of receipt, stating the action which has been taken by you, and the date when full compliance will be achieved. Your response should include a description of action (to be) taken to prevent recurrence of these deficiencies.

At this time, I wish to thank you and your staff for the courtesy and cooperation extended to our representatives.

ORIGINAL SIGNED

G. M. Schierberg
Manager
Procurement Quality Assurance

Enclosures

RGD:mc



STONE & WEBSTER ENGINEERING CORPORATION

AUDIT PLAN

TITLE:

AUDIT OF REACTOR CONTROLS INC. (RCI) - SAN JOSE, CALIFORNIA

AUDIT PLAN NO.:
RC-1984

PREPARED BY:

R.G. Drummond/G.Foley

REVISION:

N/A

DATE:

1/12/84

APPROVED BY:

*H. B. Benson**OTM Supervisor, PQA*

PAGE 1 OF 2

1.0 PURPOSE

To determine compliance by Reactor Controls Inc. to the requirements of their Quality Assurance Manual and the applicable Stone & Webster specification(s).

2.0 REFERENCES

2.1 Reactor Controls Inc. , Quality Assurance Manual, Revision 8, dated 10/7/82.

2.2 Stone & Webster's specifications

2.2.1 NMP2-P 301V Addenda 4 to Revision 0

2.2.2 GSU 228.180 Addenda 5 to Revision 0

3.0 PROCEDURE

3.1 The audit shall be performed in accordance with the following instructions:

3.1.1 Review all referenced documents.

3.1.2 Complete the attribute sheets by entering all the required information during the audit.

3.1.3 Add any additional attributes as required during the audit.

10



- 3.2 To verify the attribute "Are the procedures adequate to assure control of the system" (usually written as the last attribute in each section), examine each unsat condition and determine if the condition is a result of a procedure inadequacy.
- 3.3 The attached sampling plan (Attachment 3.1) QAD 7.11 as applicable shall be used to perform this audit.
- 3.4 All attributes not answered for any reason shall be marked NA (Not Auditable) and the reason given in the comments column.
- 3.5 Verify the program being audited also covers those components or parts which are nonpressure boundaries as defined by ASME Section III.

LOT SAMPLING PLANS

LOT OR BATCH SIZE	SAMPLE PLAN A			SAMPLE PLAN B			SAMPLE PLAN C			SAMPLE PLAN D		
	SAMPLE SIZE	ACCEPT(1) NUMBER	REJECT(2) NUMBER	SAMPLE SIZE	ACCEPT(1) NUMBER	REJECT(2) NUMBER	SAMPLE NUMBER	ACCEPT(1) NUMBER	REJECT(2) NUMBER	SAMPLE SIZE	ACCEPT(1) NUMBER	REJECT(2) NUMBER
2 to 8	ALL	0	1	All up to 5	0	1	All up to 5	1	2	ALL	0	1
9 to 15	ALL	0	1	5	0	1	5	1	2	ALL UP TO 13	0	1
16 to 25	ALL	0	1	5	0	1	5	1	2		0	1
26 to 50	ALL	0	1	5	0	1	8	2	3	13	0	1
51 to 90	50	0	1	20	1	2	13	3	4	13	0	1
91 to 150	50	0	1	20	1	2	20	5	6	13	0	1
151 to 280	50	0	1	32	2	3	32	7	8	50	1	2
281 to 500	50	0	1	50	3	4	50	10	11	50	1	2
501 to 1,200	80	1	2	80	5	6	80	14	15	80	2	3
1,201 to 3,200	125	2	3	125	7	8	125	21	22	125	3	4
3,201 to 10,000	200	5	6	200	10	11	125	21	22	100	5	6

NOTES:

- (1) Accept Number - accept lot if _____ items or less are found unsat
- (2) Reject Number - reject lot if _____ items or more are found unsat

AUDIT AGENDA
 REACTOR CONTROL SAN JOSE, CALIFORNIA

AUDIT ACTIVITY/AUDITOR ASSIGNED

DAY/DATE	* R.G. Drummond	G. Foley	W.C. Luong	T.Y. Chow
Tuesday 1/24/84 a.m.	<u>PRE-AUDIT CONFERENCE</u> Criteria III - C/A Review River Bend	<u>PRE-AUDIT CONFERENCE</u> Criteria VII - Purchasing	<u>PRE-AUDIT CONFERENCE</u> Technical Review River Bend	<u>PRE-AUDIT CONFERENCE</u> Technical Review River Bend
Tuesday 1/24/84 p.m.	Criteria III - C/A Review River Bend	Criteria VII - Purchasing	Technical Review River Bend	Technical Review River Bend
Wednesday 1/25/84 a.m.	Criteria III - Nine Mile Project	Criteria IV - Procurement Document Control	Technical Review Nine Mile Project	Technical Review Nine Mile Project
Wednesday 1/25/84 p.m.	Criteria III - Nine Mile Project	Criteria XVIII - Audits	Technical Review Nine Mile Project	Technical Review Nine Mile Project
Thursday 1/26/84 a.m.	Criteria III - Nine Mile Project	Criteria XVIII - Audits	Technical Review Nine Mile Project	Technical Review Nine Mile Project
Thursday 1/26/84 p.m.	<u>POST-AUDIT CONFERENCE</u>	<u>POST-AUDIT CONFERENCE</u>	<u>POST-AUDIT CONFERENCE</u>	<u>POST-AUDIT CONFERENCE</u>

* LEAD AUDITOR



Vendor Rep. _____

Title. _____

AUDIT PLAN ATTRIBUTES

AUDIT PLAN NO RC-1984		REV N/A	J.O NUMBER 12177.50 / 12210.50		AUDITOR(S)	AUDIT DATE
ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS	
			NO. CKD.	NO. UNSAT		
	<u>CRITERIA III</u>					
1.	<p>Verify that traveler type documents incorporate quality assurance check points.</p> <p>12177-NMP2-P301V, page 1-7, lines 6.11 - 6.13 (also see page 1-73, line 54.1 and page 1074, line 54.37)</p>					
2.	<p>Verify that in cases where conflicts exist between pipe drawings and specification requirements, RCI has asked SWEC to provide the resolution.</p> <p>P301V, page 1-25, lines 19.18 - 19.20</p>					
3.	<p>Verify that the fit up of all jacket welds shall be as detailed in RCI's quality assurance program.</p> <p>P301V, page 1-26, lines 20.27 - 20.28</p>					



AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
4.	<p>Verify that RCI has submitted their analytical report to the Engineers for approval.</p> <p>- Does the report contain a description of the input, procedures of analysis, calculations, stress report summary, equipment loading results, and support loadings and corresponding designs?</p> <p>P301V, page 1-29, lines 22.13 - 12.16</p>				
5.	<p>Verify that the following design criteria are specified in purchase orders used to purchase socket welded fittings (as delineated on page 1-33 of of specification P 301V).</p>				
6.	<p>Verify that all structural shapes shall be ASTM A-36 or equal and structural tubing is ASTM A501 or A500 Gr. B.</p> <p>P301V, page 1-34, lines 25.5 - 25.7</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
7.	<p>Verify that RCI has submitted to the Engineers for approval, bending procedures for each type of material to be bent.</p> <p>P301V, page 1-34, lines 26.13 - 26.14</p>				
8.	<p>Verify that RCI has submitted a statement indicating the paint manufacturer and brand name to the Engineers.</p> <p>P301V, page 1-56, lines 39.28 - 39</p>				
9.	<p>Verify that all RCI isometric drawings shall include the following information:</p> <p>a. Nine Mile Point Nuclear Station - Unit 2 Niagara Mohawk Power Corporation J.O. No. 12177, P.O. No. NMP2-P301V.</p> <p>b. Piping arrangement drawing number and revision.</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	c. Pipe line number				
	d. SWEC Isometric drawing no., revision and revision symbol.				
	e. SWEC tag or spool pc. mark no.				
	f. Identification and location of welds.				
	g. Component mark numbers.				
	h. Dimensions for fab.				
	i. Coordinates and elevations.				
	k. Applicable code and code classes.				
	l. SWEC pipe classes and pipe class breaks.				
	m. Initials and dates of designer and checker.				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
10.	<p>n. Contractor name.</p> <p>o. Tabulation of spool pcs.</p> <p>p. Notes as necessary.</p> <p>P301V, page 1-86, lines 65.10 - 67.50</p>				
	<p>Verify that spool piece sketches include the following information:</p> <p>a. Nine Mile Point Nuclear Station - Unit 2 Niagara Mohawk Power Corporation J.O. No. 12177, P.O. No. NMP2-P301V</p> <p>b. Piping arrangement drawing number and revision.</p> <p>c. SWEC Isometric drawing number.</p> <p>d. SWEC tag or spool piece mark number.</p> <p>e. Pipe line number.</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	<p>f. Bill of materials.</p> <p>g. Bill of labor (test, process operations, cleaning, painting, marking, and code stamping).</p> <p>h. Dimensional details.</p> <p>i. Weld identification of all shop welds.</p> <p>j. Loose material spool piece tag number.</p> <p>k. Piping class and applicable code class.</p> <p>l. Weight.</p> <p>m. Seller's name.</p> <p>P301V, page 1-89, lines 67.42 - 68.22</p>				
11.	Verify that hanger assembly sketches contain the following:				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	<p>a. All support locations with support identification numbers, individually located dimensionally with reference to structural steel column lines and radially from the center of circular structures.</p> <p>b. Existing steel in the immediate area necessary for identifying locations from which the pipe is to be supported (marked "Existing").</p> <p>c. Additional supplementary steel to be erected for the support of a particular hanger assembly (marked "new").</p> <p>P301V, page 1-91, lines 69.22 - 69.37</p>				
12.	<p>Verify that all correspondence from RCI to SWEC concerning this specification contains the following heading:</p> <p>CONTRACT NO. NMP2-P301V FABRICATION AND ERECTION OF CRD HYDRAULIC SYSTEM AND ERECTION OF RECIRCULATION SYSTEM AND INSTALLATION OF RPV INTERNALS - NINE MILE POINT NUCLEAR STATION - UNIT 2 (J.O. NO. 12177) NIAGARA MOHAWK POWER CORPORATION</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
13.	<p>Verify that subcontractors providing services for any portion of this contract have been approved in writing by the Engineers.</p> <p>P301V, page 1-93, lines 71.29 - 71.36</p>				
14.	<p>Verify that RCI has a formal program for the following:</p> <p>a. A method of controlling and incorporating changes to RCI engineering and design documents generated by:</p> <ol style="list-style-type: none"> 1. Stone & Webster (external) 2. Reactor Controls (internal) <p>General</p>				
15.	<p>Verify the correspondence received from SWEC concerning the current contracts have been properly placed into the "Engineering Control Check List" (ECCL) system.</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
16.	- Verify that documents are placed in the ECCL system in a reasonable period of time after receipt.				
	- Verify that revisions to the ECCL have been issued after a maximum of 10 revisions have been made to various listed documents.				
	- Verify that transmittal notices have been maintained with the revision affected and recorded on the ECCL by the recipient.				
	- Verify that transmittal notices have been signed by recipients to verify receipt of the notice and documents.				
	RCI QA procedure, section 2, pages 5 and 6.				
	Verify that the Project Manager has determined that a particular document should be entered into the "Document Control Center".				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
17.	<ul style="list-style-type: none"> - Verify that obsolete documents have been removed from the file, marked "OBSOLETE" and placed in the obsolete file. <p>RCI QA Procedure, Section 2, page 7.</p>				
	<p>Verify that Engineering Change Notices (ECNs) have been issued to revise or correct drawings.</p>				
	<ul style="list-style-type: none"> - Verify that ECNs have been approved by the same persons who approved the original drawing. 				
	<ul style="list-style-type: none"> - Verify that no more than six (6) ECNs are issued against each drawing. 				
	<ul style="list-style-type: none"> - Verify that ECNs have all been incorporated into each applicable drawing within six (6) months. 				
	<ul style="list-style-type: none"> - Verify that ECNs have been referenced on the applicable drawings to alert the user of the change. <p>RCI QA Procedure, Section 2, page 9</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
18.	<p>Verify that Quality Assurance audits have been conducted in the engineering and design area.</p> <ul style="list-style-type: none"> - Verify that the audit schedule has been updated at periods not exceeding thirty (30) days. - Verify that the completed audit report contains the following: <ul style="list-style-type: none"> a. Completed checklist b. Description of audited items c. List of deficiencies d. Summary of effectiveness e. Signature of auditor and date f. Audit number - Verify that all corrective action items have been closed out. <p>RCI QA Procedure, Section 2, page 4</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	<u>CORRECTIVE ACTION - RIVER BEND</u> 1. CAI 1 - Verify that all contract documents are reviewed and entered into the Document Control System in a timely manner. - Verify that training has been conducted to assure future reviews are completed and applicable documents are entered into the Document Control System in a timely manner. 2. CAI 3 - Verify that RCI has written a procedure for the incorporation of "HOLD POINTS" on spool piece drawings. - Verify that the procedure has been implemented - review several spool piece drawings for compliance. 3. CAI 4 - Verify that calculations that back-up completed designs have been formalized, completed and meet all RCI QA procedure requirements.				



AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
4.	CAI 5 - Verify that pipe clamp standards back up data is available for all standards used on SWEC projects.				



AUDIT PLAN ATTRIBUTES

AUDIT PLAN NO		REV	J.O. NUMBER	AUDITOR(S)		AUDIT DATE
ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS	
			NO. CKD.	NO. UNSAT		
	<u>TECHNICAL PORTION OF AUDIT</u>					
	<u>Pipe Stress</u>					
1.	Verify that computer program E2A17 issued 8/27/83 is being properly applied to pipe stress problems on the River Bend and Nine Mile projects by RCI.					
2.	Verify by conducting a random review of calculations that calculations for completed designs have been finalized. (See Attached Form)					
	<u>Pipe Supports</u>					
1.	Verify that standards PC-1 and PC-2 (pipe clamp standard procedure) is properly backed-up by sufficient documented design basis.					
2.	Verify by conducting a random review of calculations that calculations for completed pipe supports have been finalized. (See Attached Form).					

AUDIT PLAN ATTRIBUTES

AUDIT PLAN NO. RC-1984		REV. N/A	J.O. NUMBER 12177.50/12210.50	AUDITOR(S)		AUDIT DATE
ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS	
			NO. CKD.	NO. UNSAT.		
	<u>CRITERION VII - CONTROL OF PURCHASED MATERIAL, EQUIPMENT AND SERVICES</u>					
1	Verify that an approved vendors list (AVL) has been established, maintained, and updated at intervals not exceeding ninety (90) days. (Section 3, Pg. 5, Para. 3.2.2.e)					
2	Verify that an on site vendor survey has been employed to evaluate a prospective vendor's quality assurance program and a vendor survey report completed. (Section 3, Pg. 1, Para. 3.1.a)					
3	Verify that a vendor survey checklist and report (Exhibit D-2) is tailored to meet the specific requirements of Section III and prepared by the QA Manager. (Section 3, Pg. 1, Para. 3.1.a)					
4	Verify that the completed vendor survey check list and reports are maintained in the headquarters filed by the QA Manager. (Section 3, Pg. 1, Para. 3.1.a)					
5	Are copies of vendor's certificates of authorization or quality system certificate (material) from ASME are maintained in the headquarters file by the QA Manager? (Section 3, Pg. 1, Para. 3.1.b)					
6	Verify that when vendors are added or deleted during the interim period, the QA Manager shall mark these on the A.V.L. Section 3					



AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	<u>CRITERION VII - (cont.)</u>				
7	Are the procedures adequate to control the program? (General)				
8	Are the procedures being satisfactorily implemented? (General)				

AUDIT PLAN ATTRIBUTES

AUDIT PLAN NO. RC-1984		REV. N/A	J.O. NUMBER 12210.50/12177.50	AUDITOR(S)		AUDIT DATE
ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS	
			NO. CKD.	NO. UNSAT.		
	<u>CRITERION IV - PROCUREMENT DOCUMENT CONTROL</u>					
1.	Verify that purchase orders to vendors who don't hold ASME certificates require all material certificates to include a statement that the material was supplied in accordance with the quality assurance program approved during Reactor Controls most recent survey. (Sect. 3, page 1, para. 3.1a)					
2.	Verify that purchase orders to vendors who do hold ASME certificates require the vendor to include the quality system certificate or certificate of authorization number and expiration date on the material certificates supplied with the material. (Sect.3, page 2, para. 3.1b)					
3.	Verify that the project manager approves purchase orders. (Sect. 3, page 4, para. 3.2.1d)					
4.	Verify that the QA manager approves purchase orders and addenda or changes to purchase orders. (Sect. 3, page 5, para. 3.2.2c)					
5.	When source inspection is required verify that it is documented on a written report. (Sect. 3, page 5, para. 3.2.2d)					

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	<u>CRITERION IV</u>				
6	Verify that purchase orders indicate that the material manufacture shall not perform any welding and certification to this effect be provided. (Section 3, Page 4, Para. 3.1.g:(5))				
7	Are copies or purchase orders forwarded to the shop or job site? (Is this documented?) (Section 3, Page 6, Para. 3.2.3.c)				
8	Verify that unless otherwise specified in the engineer's drawings, structural shapes shall be purchased to ASTM A-36 or equal. (Spec. GSU C-285, pg. 1-21, line 19.7)				
9	Verify that purchase orders invoke Part 21 of Title 10 of the code of federal regulations. (Spec. GSU C285, pg. 1-73, line 60.41) (Spec. P301V, pg. 1-94, line 71.52)				
10	Verify that Austenitic stainless steel raw material is purchased and furnished in the solution - annealed unsensitized condition. (Spec. GSU C285, pg. 1-21, line 19.14) (Spec. P301V, pg. 1-34, line 25.11)				
11	Verify that CMTR are furnished which includes a statement certifying that the material supplied is in the solution-annealed, unsensitized condition and, if unstabilized, has either been water quenched or has successfully met the requirements of ASTM A 262 Practice A Figure 1. (NOTE: Fig. 2 or 4 for P-301V) (Spec. GSU C 285, pg. 1-21a, line 19.23) (Spec. P 301V, pg. 1-34, line 25.15)				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	<u>CRITERION IV</u>				
12	Verify that purchase orders for Class 2 weld material require certified material test reports be submitted.				
13	Are the procedures adequate to control the program? (General)				
14	Are the procedures being satisfactorily implemented? (General)				



AUDIT PLAN ATTRIBUTES

AUDIT PLAN NO. RC-1984		REV. N/A	J.O. NUMBER 12210.50/12177.50		AUDITOR(S)		AUDIT DATE
ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS		
			NO. CKD.	NO. UNSAT.			
	<u>CRITERION XVIII - AUDITS</u>						
1.	Verify all aspects of the Quality Assurance Program are audited on an annual basis. (Sect. 12, Pg. 1, Para. 12.1.1)						
2.	Verify an audit schedule if prepared by the Quality Assurance Manager is revised at intervals not to exceed 30 days. (Sect. 12, Pg. 2, Para. 12.1.3)						
3.	Verify internal audits are performed by personnel trained to the requirements of Reactor Controls, Inc. audit personnel training program QAI-18-2. (Sect. 12, Pg. 2, Para. 12.2.1)						
4.	Verify auditors do not have direct responsibility in the area being audited. (Sect. 12, Pg. 2, Para. 12.2.1)						

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
Cont.	<u>CRITERION XVIII - AUDITS</u>				
5.	Verify a quality assurance audit checklist is used to conduct audits. (Sect. 12, Pg. 2, Para. 12.2.2)				
6.	Verify the QA Audit Checklist is completed by the auditor and submitted to the QA Manager for review. (Sect. 12, Pg. 2, Para. 12.2.3)				
7.	Verify the completed audit report contains: a. Completed QA audit checklist b. Description of all audited items c. List of deficiencies d. A brief summary e. Signature of auditor and date f. Audit number (Sect. 12, Pg. 2, Para. 12.2.23)				
8.	Verify that for QA audits, which require corrective action to correct deficiencies, a corrective action request (CAR Exhibit X-4) is initiated by the QA Manager for each deficiency. (Section 12, pg. 3, para. 12.2.4)				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
9	Verify that the CAR and Audit Report has been transmitted to the location(s) of the individual's responsible for correction of the deficiencies. (Section 12, pg. 3, para. 12.2.4)				
10	Verify that the corrective action has been taken by the location manager and documented on the CAR. (Section 12, pg. 3, para. 12.2.5)				
11	Verify that the corrective action request is referenced to the audit by the CAR # and contains the following information: a. Description of deficiency b. Corrective action taken or being taken c. Action taken/being taken to prevent recurrence d. Completion date or expected completion date e. QA/QC verification of corrective action within 30 days of completion (NOTE: Are QA/QC qualified auditors?) (Section 12, pg. 3, para. 12.2.6)				
12	If the corrective action taken is not approved by the QA Manager, does the program identify what action is to be taken and how? (General)				

AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
Cont.	<u>CRITERION XVIII - AUDITS</u>				
13	Verify all internal audits and corrective action are reviewed by the Vice President and the QA Manager. (Sect. 12, Pg. 4, Para. 12.4.1)				
14	Verify deficiencies noted during audits and corrective action taken is tabulated and presented to the management review board. (Sect. 12, Pg. 4, Para. 12.5.1)				
15	Verify a summary report of the Reactor Controls Inc. audit program is prepared on an annual basis by the QA Manager and the results reported to the Vice President. (Sect. 12, Pg. 5, Para. 12.5.3)				
16	Are the procedures adequate to control the program? (GENERAL)				
17	Are the procedures being satisfactorily implemented? (GENERAL)				



INTEROFFICE MEMORANDUM

A 040.28

SUBJECT QUALITY ASSURANCE AUDIT REPORT
REACTOR CONTROLS INC. (RCI)
SAN JOSE, CA.

TO G. M. Schierberg

J.O. OR 12210.50/12177.50
W.O. NO.

DATE August 22, 1984

FROM W. E. Bezanson:nks

CC General Files
Chrono Files
JHarrison/Audit File(2)
RJPalleschi/QIC File
RBKelly
JEHuston
RKMaxon
TJFitzgibbon
WHDarragh
WHGrieves
CLTerry
RLLykens
EDiem
WMEifert(2)
JTPlant
TCrouse
RBAvrich
FACanuso
CZappile
JAKirkebo
JWhedbee
MYeminy
KRMiller
ACampana
RGDrummond ✓

THIS AUDIT APPLIES TO:

GULF STATES UTILITIES COMPANY - RIVER BEND STATION UNIT #1

NIAGARA MOHAWK POWER CORPORATION - NINE MILE POINT UNIT #2

STONE & WEBSTER ENGINEERING CORPORATION
PROCUREMENT QUALITY ASSURANCE DIVISION

T-381A

AUDIT EVALUATION FORM

SUPPLIER AND LOCATION

Reactor Controls Inc.
1245 So. Winchester Blvd.
San Jose, CA 95128

PREPARERS SIGNATURE

R. G. Drummond
R. G. Drummond

MATERIAL MANUFACTURED AT FACILITY

Control Rod Drive Piping

DATE OF AUDIT

July 24-26, 1984

AUDIT RESULTS

Open-Pending Resolution of Corrective Action
Items

ASME CERTIFICATES HELD

CERTIFICATE NUMBER(S):

None (for Engineering and Design)

CURRENT SWEC CONTRACTS

Gulf States Utilities Co.
228.180-C285

Niagara Mohawk Power Corp.
P-301V

CORRECTIVE ACTION REQUIRED

Yes-See Audit Summary

COMMENTS

Completed audit checklists along with all back-up data
are on file at the Stone & Webster Engineering Corp.,
Procurement Quality Assurance Division, Boston, MA.

FUTURE ACTION DATE

Thirty (30) days after receipt of
this report.

APPROVED BY SIGNATURE

F. J. Zucchetto

QUALITY ASSURANCE AUDIT REPORT
REACTOR CONTROLS INC.
SAN JOSE, CA. 95128

On July 24-26, 1984 Stone & Webster Engineering Corporation conducted a Quality Assurance Audit at the San Jose California facility. The purpose of the audit was to verify Reactor Controls Inc's compliance to their Quality Assurance Program, the applicable Stone & Webster specification requirements, and the intent of the following criteria of Appendix "B" to 10CFR50.

CRITERION III - DESIGN CONTROL

CRITERION XVIII - AUDITS



PERSONNEL CONTACTED AND ASSISTING IN THE AUDIT WERE

REACTOR CONTROL INC. PERSONNEL

* R. Crum	-	Quality Assurance Manager
* D. Jasman	-	Quality Assurance Specialist
* A. Nelson	-	Project Manager (NMP)
* G. Secchi	-	Engineering & Construction Manager (NMP&RB)
* R. Chaudhari	-	Lead Engineer
* M. Scales	-	Design Project Engineer (NMP)
* V. Durvasula	-	Project Engineer (NMP)
* L. Nishiguchi	-	Engineering Manager
* S. Schmuckler	-	Lead Engineer
C. Martin	-	Analysis Project Engineer (RB)
B. Mackellar	-	Project Engineer (RB)

STONE & WEBSTER AUDIT TEAM PERSONNEL

* W. Luong	-	Section Manager EMD
* S. Malhotra	-	Coordinator
* W. Tewfik	-	Resident Engineer
* T. Chow	-	Section Manager EMD
* R. Drummond	-	Lead Auditor

OBSERVER

* E. Epstein	-	Responsible Engineer (NMP)
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* Denotes attendees at exit critique.

AUDIT CONCLUSIONS

It is the conclusion of the audit team that Reactor Controls Inc. is not complying with certain requirements of their Quality Assurance Program, the applicable Stone & Webster specification, and the referenced criteria of Appendix "B" to 10CFR50, in the areas audited as referenced below. However, the results of this audit indicate that shipments should not be stopped nor should a Stop Work Directive be issued.

AUDIT SUMMARY

This report contains observations which are not in compliance with established requirements, or were determined to be in need of improvement.

During the conduct of the audit 24 attributes were checked, resulting in 664 observations, of which 1 was nonconforming.

NOTE: Those items identified with the prefix "CAI" require a written corrective action response. Those items in Attachment "A" are recommendations only however, a written response is required.



CRITERION III

DESIGN CONTROL

CAI 1

Reactor Controls Inc. has chosen to use "Task Books" to assemble design data, including calculations for pre-defined areas of SWEC contracts.

During the audit a number of problems were identified in these "Task Books", as noted below.

- A. Task Books are required to be signed and dated by (1) preparer, (2) reviewer and (3) approver, however the task books only contain one(1) date for all three(3) signatures. In many cases the book was dated by the preparer before the reviewer and approver signed.
- B. Many task books contain pages marked with the same revision number as the book, but in some instances the pages are dated after the books have been signed and dated. (River Bend Project Only) (In some cases the book is marked Revision 3 but some pages dated later than Rev. 3 are marked revision "0")

Task Book #SA-2462 is marked revision 0, yet the last section of the book contains almost 100 obsolete pages which have apparently not been replaced in the book because none of the pages in the book are marked revision 1.

- C. Many task book pages did not contain the following information:
 - 1. page numbers
 - 2. not all "obsolete" pages so marked
 - 3. calculation numbers
 - 4. all required signatures.

NOTE: During the audit most of the above four items were corrected by the issuing groups.

- D. Several calculations were noted with problems concerning "Engineering Change Notices" (ECN's)
 - 1. SA-4825 contained ECN #227 as an attachment. ECN #227 had nothing to do with SA-4825.
 - 2. SA-4830 should have contained ECN #227 as an attachment instead of SA-4825
 - 3. The Appendix to SA-2463 contains the results of an evaluation of an ECN, however the ECN is not identified.

- E. On several occasions during the audit, the technical auditors were not able to follow some of the calculation logic, input or assumptions. They requested definition by RCI Project people and other personnel were brought in to explain some details.

These task books and calculations must be sufficiently detailed as to design input, assumptions, references such that a person technically qualified in the subject can review, understand, and verify the adequacy of the results without recourse to the originator.

RECOMMENDATION:

RCI Quality Assurance Instructions (QAI's) must be upgraded to address more clearly all the problems noted above. Many of the task books will be revised during the "As-Built" reconsiliation period, and during this time the books must be updated to meet procedure requirements, in preparation for future turnover to station personnel.

CORRECTIVE ACTION AUDIT SUMMARY

The following corrective action items of the audit conducted on January 24-26, 1984 were satisfactorily verified and are considered closed:

CAI-1, CAI-2, CAI-3, CAI-4(u)

The following corrective action item remains open pending further action:

CAI-2(U)

With the incorporation of the open corrective action items in this report, the audit of January 24-26, 1984 is now considered closed.

Open items from the January 24-26, 1984 audit (RCI)

CRITERION III - DESIGN CONTROL

CAI 2(U)

Specification 12210 - 282.180, Page 1-70, Lines 56.49 and 58.11 require RCI drawings, isometrics, and sketches contain specified minimum information.

None of the drawings, isometrics, and sketches reviewed during the audit contained all of the required information.

Examples of missing information are:

1. Job numbers
2. Contract of specification numbers
3. SWEC line designation numbers
4. Reference drawings and revisions
5. Spool piece mark numbers
6. Material lists.

RECOMMENDATION

Provide compliance with specification requirements or obtain a specification change from the SWEC Project.

RCI'S RESPONSE, DATED APRIL 16, 1984 AND CORRECTIVE ACTION RESULTS

RCI stated that they would submit a specification change request to Stone & Webster by May 1, 1984.

CORRECTIVE ACTION AUDIT RESULTS

RCI has not requested the specification change to date.

RECOMMENDATION

RCI should submit the request asking changes to the specification for all listed documents to waive the requirements.

CLOSED ITEMS FROM PREVIOUS AUDITS

- CAI 1 - A review of Purchase Order File #11206-01 indicates that the subject TWX had been reviewed, approved and placed in the proper file.
- CAI 2 - QAI-3-1 Instruction for Engineering/Analysis Design Control has been approved and issued for the preparation and control of calculations.

CAI 3 - In late 1983 RCI's Management Review Board determined that more emphasis should be placed on responding to audit findings. A revised procedure was issued dealing with Corrective Action Requests (CAR's). Since then The Quality Assurance Group has been more aggressive in pursuing audit responses.

In the past six months only two audit responses have been late. One was one day late and the other only three days late. This record reflects the commitment that RCI has made to respond to audit findings in a more timely manner.

CAI 4(U) - All of the final designs sampled during the audit were backed up by formalized fully approved calculation.

ATTACHMENT "A"

RECOMMENDATIONS

CRITERION III - DESIGN CONTROL

R-1

Task book SA-1601 lists the angle between modes 230 and 250 as 11° . The angle should be 10.5° according to the input document.

R-2

In each of the task books sampled during the audit, it was noted that RCI uses a preprinted list of references. Many of the listed references are not used in the calculations, but no attempt is made to indicate which of the references are utilized by marking those references that are used.

R-3

When referencing computer runs in Task Books and calculations it is RCI's practice to list the computer run date, or the computer file sign-off date. It is recommended that the date of the computer run date only be used in references, so as to avoid confusion.

R-4

When transmitting new loads for supports from one calculation to another by ART's, it is recommended that RCI list all supports effected by the higher loads on the ART.

Several ART's were noted with only a partial listing of supports for a given calculation.



COPY

Mr. Robert Crum
Quality Assurance Manager
Reactor Controls Inc.
1245 So. Winchester Blvd.
San Jose, CA 95128

August 22, 1984

12210.50/12177.50

QUALITY ASSURANCE AUDIT REPORT
REACTOR CONTROLS INC.

Transmitted herewith are the results of the audit conducted at your facility on July 24 - 26, 1984.

You are requested to review this report and submit your comments on the corrective action items within thirty (30) days of receipt, stating the action which has been taken by you, and the date when full compliance will be achieved. Your response should include a description of action (to be) taken to prevent recurrence of these deficiencies.

At this time, I wish to thank you and your staff for the courtesy and cooperation extended to our representatives.

ORIGINAL SIGNED

G. M. Schierberg
Manager
Procurement Quality Assurance

Enclosures

RGD:nks



STONE & WEBSTER ENGINEERING CORPORATION

AUDIT PLAN

TITLE:

AUDIT OF REACTOR CONTROLS INC. (RCI) OF SAN JOSE CALIFORNIA

AUDIT PLAN NO.:
RCI-1984A

PREPARED BY:

R.G. Drummond

REVISION:

0

DATE:

7/2/84

APPROVED BY:

- Supervisor, PQA

PAGE 1 OF 2

1.0 PURPOSE

To determine compliance by Reactor Controls Inc. to the requirements of their Quality Assurance Manual and the applicable Stone & Webster specification(s).

2.0 REFERENCES

2.1 Reactor Controls Inc. , Quality Assurance Manual, Revision 9, dated 9-21-83

2.2 Stone & Webster's specifications

2.2.1 GSU - 228.180 Revision 0 Addenda 6

2.2.2 NMP2 - 301V Revision 0 Addenda 5

3.0 PROCEDURE

3.1 The audit shall be performed in accordance with the following instructions:

3.1.1 Review all referenced documents.

3.1.2 Complete the attribute sheets by entering all the required information during the audit.

3.1.3 Add any additional attributes as required during the audit.



- 3.2 The attached sampling plan (Attachment 3.1) QAD 7.11 as applicable shall be used to perform this audit.
- 3.3 All attributes not answered for any reason shall be marked NA (Not Auditable) and the reason given in the comments column.
- 3.4 Each attribute marked unsatisfactory shall be evaluated by the auditor to determine if the noncompliance should be processed in accordance with QS-15.1, "Nonconformance and Disposition Report" QS-16.1, "S&W Problem Reports", QS-12.2, "Notifying Clients of Potentially Reportable Deficiencies under 10CFR50.55", or QS-16.3, "Identifying and Reporting Defects and Failure to Comply under 10CFR21".

LOT SAMPLING PLANS

LOT OR BATCH SIZE	SAMPLE PLAN A			SAMPLE PLAN B			SAMPLE PLAN C			SAMPLE PLAN D		
	SAMPLE SIZE	ACCEPT(1) NUMBER	REJECT(2) NUMBER	SAMPLE SIZE	ACCEPT(1) NUMBER	REJECT(2) NUMBER	SAMPLE NUMBER	ACCEPT(1) NUMBER	REJECT(2) NUMBER	SAMPLE SIZE	ACCEPT(1) NUMBER	REJECT(2) NUMBER
2 to 8	ALL	0	1	All up to 5	0	1	All up to 5	1	2	ALL	0	1
9 to 15	ALL	0	1	5	0	1	5	1	2	ALL UP TO 13	0	1
16 to 25	ALL	0	1	5	0	1	5	1	2		0	1
26 to 50	ALL	0	1	5	0	1	8	2	3	13	0	1
51 to 90	50	0	1	20	1	2	13	3	4	13	0	1
91 to 150	50	0	1	20	1	2	20	5	6	13	0	1
151 to 280	50	0	1	32	2	3	32	7	8	50	1	2
281 to 500	50	0	1	50	3	4	50	10	11	50	1	2
501 to 1,200	80	1	2	80	5	6	80	14	15	80	2	3
1,201 to 3,200	125	2	3	125	7	8	125	21	22	125	3	4
3,201 to 10,000	200	5	6	200	10	11	125	21	22	100	5	6

NOTES:

- (1) Accept Number - accept lot if _____ items or less are found unsat
- (2) Reject Number - reject lot if _____ items or more are found unsat

AUDIT PLAN ATTRIBUTES

VENDOR REP. _____

TITLE _____

AUDIT PLAN NO. RCI-1984-A	REV 0	J.O. NUMBER 12210.50	AUDITOR(S) RGDrummond/WLuong/TChow	AUDIT DATE July 23-27, 1984
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ATT. NO.	ATTRIBUTES	LOT SIZE	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT	
	<u>RIVER BEND PROJECT</u> CRITERION <u>III Design Control</u> 1. Verify that design document SA-932-DAO, for GSU on Appendix "D" lists all computer programs used on the project. <u>General (R-1)</u> 2. Verify that design document SA-4029 Code required equations have been properly completed. <u>General (R-2)</u> 3. Verify that design documents contain all referenced appendices and attachments. <u>General (R-3)</u>				
	TOTAL: ATTRIBUTES _____ OBS. CKD. _____ OBS. UNSAT _____				



AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
4.	Has RCI attached to calculations microfilm or microfiche copies of computer output if the size of the output is voluminous? <u>General</u> (R-4)				
5.	Verify that completed calculations used for final design have all the required signatures. <u>General</u> (R-5)				
6.	Verify that RCI has obtained SWEC approval of their procedure for the as-built and final stress reconciliation program (228.180 page 1-18 lines 17.7/2)				
7.	Verify that RCI has obtained SWEC approval of the "water hammer analysis" and "model verification" report. (228.180 page 1-18a lines 17.8/33)				
8.	Verify that RCI has obtained SWEC approval of the "jet impingement" report. (228.180 page 1-18b lines 17.8/64)				
9.	Verify that RCI has in their design of CRD piping in the containment area outside the drywell, considered the effect of the "Froth Impact Loads" and "Froth Drag Loads"? (228.180 page 2-11-2 lines 1.26/158)				



AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RES. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
10.	<p>Has RCI verified the existance of any of the so-called "Stiff" pipe clamps as described in IE Bulletin 83-80 in the designs for the River Bend Project?</p> <p>(IE Bulletin 83-80 and Letter to RCI from SWEC dated March 23, 1984).</p>				
11.	<p>Select several skewed angle welds designed by RCI on various pipe support structures and review the design back-up material.</p> <p>(General) (Potential problem noted at the RB site)</p>				
12.	<p>Select several drawings and compare them to their respective mathematical models to check for continuity and compatability.</p> <p>(General)</p>				
13.	<p>Verify that RCI is designing safety related supports and components to withstand all loads resulting from postulated pipe breaks without consideration of pipe whip restraints.</p>				



AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	Select supports from the following list:				
	PSS-700 PSR-564B PSR-789				
	PSS-713 PSR-565B PSR-566B				
	PSR-703 PSR-576B PSA-567B				
	PSR-738 PRS-737 PSR-571B				
	PSA-787 PRS-733 PSA-775				
	PSR-791 PRS-717 PSR-574B				
	PSS-790 PRS-709 PSR-573B				
	PSR-7107 PSS-701 PSR-575B				
	PSR-577B PSR-795 PSR-568B				
	PSR-562B PSA-7101				
	(RCI procedure SA-4864-RVB Rev. 4 Section 3.0)				

CALCULATION NUMBER →							J.D. No
CALCULATION ATTRIBUTES →							Remarks:
Cover Sheet:							
Client							
Project							
Document							
Originated							
Revision							
Page and Continuation							
Calculation Title							
Rev. No.							
Preparer Date							
Checked by Date							
Approved by Date							
Revision Description							
Identification of:							
References							
Input							
Assumptions							
Retrievability							

pg. 5



CALCULATION NUMBER →

CALCULATION ATTRIBUTES →

J.O. No.
REMARKS:

Page Accountability

Page No. on each page

Calculation No. on each page

Is the reason for the calculation obvious?

Conclusion respond to reason

Is the conclusion properly transcribed into the final design?

Pg. 6



CALCULATION NUMBER →

CALCULATION ATTRIBUTES →

J.D.N:
REMARKS!

Is the method used proper?

Are equations identified or easily recognizable?

Is conclusion properly arrived of?

Are all input values adequately identified?

How are assumptions confirmed?

Are calculations revised in a manner that provides tracking to all original revisions?

Does the calculation contain all referenced addenda or attachments?

88 7

AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	<u>CORRECTIVE ACTION</u>				
1. (NMP)	Assure that RCI has taken the following action as stated in their reply dated June 14, 1984: a. The TWX has been reviewed and approved according to the review and approval process. b. The approved TWX has been placed in the Purchase Order file #11206-01. (CAI-I)				
2. (RB) (NMP)	Using the new procedure, (on calculation preparation) assure that current calculations have been prepared and reviewed as required. (CAI. 2) (use attached work sheets)				
3. (RB)	Verify that a change to specification 282.180 on page 1-70 lines 56.49 - 58.11 has been requested by RCI and approved by SWEC. (CAI. 2(u))				

AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
4. (RB) (NMP)	<p>Verify that the review and update of the calculation task files have been completed as stated by RCI.</p> <p>- Verify that final designs are backed up by formalized, fully approved calculations meeting the requirements of RCIs procedure QAI-3-1.</p> <p>(CAI-4(u) use attached work sheets)</p>				

AUDIT PLAN ATTRIBUTES

AUDIT PLAN NO. RCI-1984 A	REV 0	J.O. NUMBER 12177.50	AUDITOR(S)	AUDIT DATE July 23-27, 1984
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ATT. NO.	ATTRIBUTES	LOT SIZE	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT	
	NINE MILE PROJECT CRITERION <u>III Design Control</u>				
1.	Verify that design and engineering aspects of the Quality Assurance Program have been audited for the current year. (RCI QA Manual Section 12)				
2.	Verify that the audit schedule has been prepared and revised at intervals not exceeding 30 days. Have copies been sent to all managers by the Quality Assurance Manager. (RCI QA Manual Section 12)				
	TOTAL: ATTRIBUTES _____ OBS. CKD. _____ OBS. UNSAT _____				

AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RES. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
3..	<p>Verify that corrective action requests (CAR) contain the following information:</p> <ul style="list-style-type: none"> a. Description of deficiency. b. Corrective action taken or being taken. c. Action taken to prevent recurrence. d. Completion date of corrective action. e. QA/QC verification of corrective action. <p>(RCI QA Manual Section 12)</p>				
4.	<p>Verify that RCI has not utilized any of the so called "Stiff" pipe clamps described in IE Bulletin 83-80 in the Nine Mile Point designs.</p> <p>(IE Bulletin 83-80)</p>				
5.	<p>Select several mathematical models and compare them to their referenced drawings for compatability.</p> <p>(General)</p>				



AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
6.	<p>Select several manual calculations and review them using the enclosed check sheets.</p> <p>NOTE: After reviewing the new RCI calculation procedure, add more attributes to the check sheets.</p> <p>(RCI Procedure on Calculation Preparation and Approval)</p>				

CALCULATION NUMBER →

CALCULATION ATTRIBUTES →

Cover Sheet:

Client

Project

Document

Originated

Revision

Page and Continuation

Calculation Title

Rev. No.

Preparer Date

Checked by Date

Approved by Date

Revision Description

Identification of:

References

Input

Assumptions

Retrievability

CALCULATION NUMBER →							REMARKS!
CALCULATION ATTRIBUTES →							
Page Accountability							
Page No. on each page							
Calculation No. on each page							
Is the reason for the calculation obvious?							
Conclusion respond to reason							
Is the conclusion properly transcribed into the final design?							



<div>CALCULATION NUMBER →</div>							<div>REMARKS!</div>
<div>CALCULATION ATTRIBUTES →</div>							
<div>Is the method used proper?</div>							
<div>Are equations identified or easily recognizable?</div>							
<div>Is conclusion properly arrived of?</div>							
<div>Are all input values adequately identified?</div>							
<div>How are assumptions confirmed?</div>							
<div>Are calculations revised in a manner that provides tracking to all original revisions?</div>							
<div>Does the calculation contain all referenced addenda or attachments?</div>							



STONE & WEBSTER ENGINEERING CORPORATION

AUDIT PLAN

TITLE:

AUDIT OF REACTOR CONTROLS, INC. (RCI)

AUDIT PLAN NO.:

PREPARED BY:

R.G. Drummond

REVISION:

0

DATE:

APPROVED BY:

PAGE 1 OF 3

- Supervisor, PQA

1.0 PURPOSE

To determine compliance by Reactor Controls, Inc. to the requirements of their Quality Assurance Manual and the applicable Stone & Webster specification(s).

2.0 REFERENCES

2.1 Reactor Controls, Inc., Quality Assurance Manual, Revision 6, dated 8/1/84

2.2 Stone & Webster's specifications

2.2.1 Shop Fabrication, Field Fabricated, Field Erection, and Testing of Control Rod Drive System Piping

2.2.2 RCI procedure #ABRS-1 Rev. 1 - AS-Builts Reconciliation

2.2.3 RCI procedure #ABWD-1 Rev. 3 - As-Built Walkdowns

3.0 PROCEDURE

3.1 The audit shall be performed in accordance with the following instructions

3.1.1 Review all referenced documents.

3.1.2 Complete the attribute sheets by entering all the required information during the audit.

3.1.3 Add any additional attributes as required during the audit.

- 3.2 To verify the attribute "Are the procedures adequate to assure control of the system" (usually written as the last attribute in each section), examine each unsat condition and determine if the condition is a result of a procedure inadequacy.
- 3.3 The attached sampling plan (Attachment 3.1) QAD 7.11 as applicable shall be used to perform this audit.
- 3.4 All attributes not answered for any reason shall be marked NA (Not Auditable) and the reason given in the comments column.
- 3.5 Verify the program being audited also covers those components or parts which are nonpressure boundaries as defined by ASME Section III.
- 3.6 Each attribute marked unsatisfactory shall be evaluated by the auditor to determine if the noncompliance should be processed in accordance with QS-15.1, "Nonconformance and Disposition Report" QS-16.1, "S&W Problem Reports", QS-12.2, "Notifying Clients of Potentially Reportable Deficiencies under 10CFR50.55", or QS-16.3, "Identifying and Reporting Defects and Failure to Comply under 10CFR21".

TYPE AL OBSERVATIONSVP
VHD-
VH -






VENDOR REP. _____

AUDIT PLAN ATTRIBUTES

TITLE _____

AUDIT PLAN NO. RCI-1984B		REV 0	J.O. NUMBER	AUDITOR(S)		AUDIT DATE
ATT. NO.	ATTRIBUTES	LOT SIZE	OBSERVATIONS		COMMENTS	
			NO. CKD.	NO. UNSAT		
	<p>CRITERION <u>III Design Control</u></p> <p>NOTE: This audit plan consists of the following sections:</p> <p>A. Corrective Action (last audit) <i>(to be prior)</i></p> <p>B. Administration of As-Built Reconciliation Program</p> <p>C. Technical Portion of audit.</p> <p>A. Corrective Action</p> <p>See Next Sheet</p> <p>TOTAL: ATTRIBUTES _____ OBS. CKD. _____ OBS. UNSAT _____</p>					

AUDIT PLAN ATTRIBUTES






ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
B.	<p> <u>AS BUILT RECONCILIATION PROGRAM</u></p> <p>1. Prior to as-built walkdown have all applicable ECN's been incorporated into its relevant drawing?</p> <p>RCI Procedure ABWD-112W Section 3.1.</p> <p></p> <p>2. Prior to as-built walkdown have all NCR's written against the system been closed</p> <p>ABWD-1 Section 3.3</p> <p></p> <p>3. Verify that the applicable engineering drawings listed on page 3 of ABWD-1 have been stamped with the "Walkdown Stamp" shown on Attachment A of ABWD-1.</p> <p></p> <p></p>				



AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RES. ORG.	OBSERVATIONS		COMMENTS
			NO. CEB.	NO. UNSAT.	
	<p>a. Does the stamp contain all necessary stamps, signatures and date on each of the drawings reviewed?</p>				
4.	<p>Verify that all analysis has been completed and signed out for the various systems before the walkdown.</p> <p>ABWD-1 Section 3.6.</p>				
5.	<p>Verify that drawings used in the walkdown have been marked up to show the following:</p> <p>a. Pipe support locations, if out of tolerance.</p> <p>b. Support type.</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	<p>c.  Area where expected pipe movements will properly interfere with other equipment.</p> <p>d. Welds will be documented to type and configuration. </p> <p>e. Dimensions of pipe and pipe fittings if not within the specified tolerances. </p> <p>ABWD-1 Section 5.0</p>				
6.	<p>Verify that Attachment B to ABWD-1 (Walkdown Report) has been properly filled out and signed by the walkdown team leader, project manager and the analysis project engineer, in addition to the walkdown engineer, QA engineer and the project manager again for verification of disposition.</p>				



AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CND.	NO. UNSAT.	
7.	<p>Verify that final documentation includes as-built drawings, task files, and Design Analysis reports.</p> <p>a. Have all as-built drawing deviations been identified and reconciled and placed in the appropriate task file(s)?</p> <p>RCI Procedure ABRSA Rev. 1, Section 1.0.</p>				
8.	<p>Prior to the walkdown, has RCI conducted a review of the analysis to assure that the analysis has been performed to the latest design documents?</p> <p>ABRSA-1, Section 3.2.1</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
9.	<p>Verify that RCI has prepared the "Final Design Review Document Register" listing all current contract documents.</p> <p>- Is it properly filled out as applicable by the reviewer.</p> <p>ABRSA-1 Section 4.2.5</p>				
10.	<p>Verify that RCI has prepared a "Final Design Review Checklist" to check the adequacy and completeness of the analysis.</p> <p>- Is the form properly filled out as required by the reviewer?</p> <p>ABRSA-1, Section 4.2.6</p>				



AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
11.	<p>Verify that RCI has prepared a "Final Design Review Resolution Sheet" if the "Final Design Review Checklist" indicates a need of resolving an item on the checklist.</p> <p>- Is the form properly filled out as required by the reviewer?</p> <p>Are all items requiring resolutions listed on this sheet?</p> <p>ABRSA-1, Section 4.2.6</p>				
12.	<p>Verify that when the "Final Design Review" package is completed, a copy is contained in the respective task file, and the original is kept in the Project File.</p> <p>ABRSA-, Section 4.2.10</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
13.	<p>Verify that as a part of the "Walkdown" documents, a calculation has been generated and included defining maximum expected pipe/support movements for each system.</p> <p>ABRSA-1, Section 4.2.10</p>				
14.	<p>Verify that the Project Manager has developed a schedule and manpower plan to accommodate the confirmatory analysis.</p> <p>ABRSA-1, Section 4.2.10</p>				
15.	<p>Verify the project engineers are preparing Analysis/As-Built Differences Reconciliation Sheet after the walkdown.</p> <p>- Is it properly filled out by the assigned project engineer.</p> <p>ABRSA-1, Section 6.1.1 & 6.1.2</p>				

AUDIT PLAN ATTRIBUTES






ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKB.	NO. UNSAT.	
16.	<p>Verify that the completion of the As-Built Reconciliation and Analysis, As-Built Drawings have been issued to show present condition of RCI supplied pipe and support components.</p> <p>ABRSA-1, Section 7.0</p>				
17.	<p>Verify that RCI has prepared the "Final Stress Report".</p> <p>a. Does the report contain as a minimum</p> <p>a. Title Page</p> <p>b. Approval Page</p> <p>c. Certification page</p> <p>d. Table of Contents</p> <p>e. List of Tables</p>				



AUDIT PLAN ATTRIBUTES

ITEM NO.	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	<div style="margin-left: 20px;"> </div> <p>7. List of Figures</p> <p>8. Text:</p> <ol style="list-style-type: none"> 1. Introduction 2. Scope 3. System description 4. Description of Method 5. Results 6. Summary and conclusion 7. References <p>h. Appendix</p> <ol style="list-style-type: none"> 1. Computer program description 2. Back-up calculation. 				






AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	REV. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
	 <p>b. Has it been submitted to SWEC for review and approval?</p> <p>ABRSA-1, Section 7.0.</p>				
	 <p>The following attributes are not taken from known existing RCI procedures, however these attributes are considered essential for a fully documented as-built program.</p>				
18.	<p>What procedures govern the Final Design Review and As-Built Reconciliation Program including prerequisite activities for sign-off of N.5 ?</p> 				
19.	<p>Do the procedures identify which piping systems are applicable to this program?</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKB.	NO. UNSAT	
20.	Do the procedures identify which groups are involved in this program?				
21.	Do the procedures identify the responsibilities of each group and how they interface?				
22.	Is there a schedule for the program?				
23.	Is there a status maintained for the program?				

AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RE ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
24.	<p>Are these requirements adequate?</p> <p>a. Do the procedures describe what information must be collected and submitted for N.5 signoff.</p> <p style="text-align: center;"></p> <p>b. Is there a method to identify information requiring confirmation?</p> <p style="text-align: center;"></p> <p style="text-align: center;"></p>				
25.	<p><u>FINAL DESIGN REVIEW</u></p> <p>What are the approved documents to be used as sources of input in the Final Design Review?</p>				

AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
26.	<p>Do the approved documents contain directly, or by reference, all sources of input?</p> <p>a. Are all sources of input traceable?</p>				
27.	<p>Do completed calculations reference the latest revision of source documents and are they based upon the approved source documents?</p> <p>a. Have the requirements of the procedures been complied with on completed packages?</p>				
28.	Do support calculations contain the final loads?				

AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	REQ. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
29.	<div style="position: relative;"> Q Is there evidence that the stress calculations has been reconciled with the final as-built piping drawing? </div>				
	<u>AS-BUILT RECONCILIATION</u> <div style="position: relative; top: 10px;"> Q </div>				
30.	Are the lines to be as-built identified? a. Does this account for all the lines? <div style="position: relative; top: 10px;"> Q </div> b. If the answer to "2" is no, is there a criteria to assure these are representative of all lines?		<div style="position: relative; top: 10px;"> Q </div>		
					<div style="position: relative; top: 10px;"> Q </div>

AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
31.	<p>Are the applicable drawings the latest revisions and do they reflect the latest analyses?</p> <p>a. Are all documents marked walkdown?</p>				
32.	<p>Do the as-builts demonstrate that all the attributes required to be shown by the procedures have been checked?</p> <p>a. piping configuration and geometry</p> <p>b. location of fittings</p> <p>c. location/orientation of valves</p> <p>d. types of bends</p>				


AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	REQ. ORG.	OBSERVATIONS		COMMENTS
			NO. CND.	NO. UNSAT.	
	e. support location				
	f. support type and orientation				
	g. Are clearances checked against pipe movements?				
33.	Are the latest math models used in the walkdown?				
34.	Have all analyses been completed and all open items closed out?				

AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	RESP. ORG.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT.	
35.	Does a procedure exist to stipulate measuring techniques and criteria to the walkdown team?				

AUDIT PLAN ATTRIBUTES

ITEM NO	ATTRIBUTES	OBS.	OBSERVATIONS		COMMENTS
			NO. CKD.	NO. UNSAT	
C	 <p>1. Select several typical calculations from the following systems and conduct a technical review:</p> <p style="margin-left: 20px;">a. Scram header piping</p> <p style="margin-left: 20px;">b. Control station piping (use attached matrice)</p> <p>General</p> 