

CONSOLIDATED EDISON OF NEW YORK
INDIAN POINT UNIT NO. 2

SERVICE WATER SYSTEM OPERATIONAL PERFORMANCE INSPECTION
SELF-ASSESSMENT PLAN

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SERVICE WATER SYSTEM OPERATIONAL PERFORMANCE INSPECTION (SWOPI)

SELF-ASSESSMENT PLAN

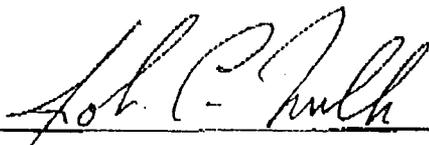
The objectives of this self-assessment are threefold:

- 1) To assess Consolidated Edison's planned and completed actions in response to GL 89-13, "Service Water System Problems Affecting Safety-Related Equipment".
- 2) To verify that the Service Water System (SWS) is capable of fulfilling its thermal-hydraulic performance requirements, and is operated consistent with its design basis.
- 3) To assess the SWS operational controls, maintenance, surveillance and other testing, and personnel training to ensure the SWS is operated and maintained so as to perform its safety-related functions.

To assure that these objectives are met, Con Edison management has requested that a self-assessment be performed that is at least equivalent to the scope and depth specified in the NRC Temporary Instruction for Service Water System Operational Performance Inspection. The basis for this self-assessment consists of the NRC Inspection Manual Temporary Instruction 2515/118, Revision 1,

"Service Water System Operational Performance Inspection (SWOPI)",
and NRC Inspection Manual, Inspection Procedure 40501, "Licensee
Self-Assessment Related to Area-of-Emphasis Inspection".

Prepared by:



Manager, Audits & Programs

Approved by:



Director, Nuclear Quality Assurance

**Service Water System Operational
Performance Inspection
Self-Assessment Plan**

1.0 INTRODUCTION

The plan includes the self-assessment scope and methodology, provides a schedule, assigns responsibilities, describes team qualifications, treatment of findings, and timely corrective action for a Service Water System Operational Performance self-assessment.

The assessment will include a comprehensive review of the Indian Point Unit No. 2 Service Water System (SWS) including design requirements, operations, maintenance, surveillance and testing, maintenance and performance history, quality assurance and implementation of corrective actions. An assessment checklist based on NRC Temporary Instruction 2515/118, Rev. 1, will be used to conduct the assessment. Recent system performance, events and problems will be reviewed to assess current system status and the effectiveness of corrective actions. To the extent practicable, issues arising from other plant SWS inspections will also be considered. This review will evaluate the results and corrective actions of prior Con Edison and NRC assessments of the SWS.

2.0 METHODOLOGY

The evaluation of the existing service water system, which reflects changes since inception of plant operations, will be emphasized. The assessment will begin with the accumulation of design requirements including Design Basis Documents and other engineering documents. Regulatory/Licensing requirements, as reflected in the UFSAR and NRC correspondence, will also be obtained.

In addition, selected industry events/concerns which relate directly to the SWS will be evaluated. The Indian Point Unit No. 2 response to Generic Letter 89-13 will be reviewed in each of the SWOPI areas. The assessment will be conducted by a qualified independent team.

2.1 Design Review

The design review will evaluate the technical adequacy of the system concentrating on essential safety and operational characteristics. The review will consider items such as design conditions and transients, component classification, equipment conditions and transients, equipment qualification, single failure criteria, potential flooding, common mode failure, corrosion/erosion due to flow and biological mechanisms, and a

selection of other attributes that contribute to the effectiveness of the system.

The review will also include the impact of modifications on items such as:

Design Basis Documents

UFSAR

Drawings

Calculations

Procedures and Tests

Plant Technical Specifications

Vendor Documentation

Training

2.1.1 Mechanical System Design Review

This portion of the assessment will evaluate the design of each system component required

to satisfy the operational and safety functions of the system described in the design and licensing basis. This evaluation will review design documents, safety evaluations, and modification packages. Discussions will be held with plant and project personnel in the mechanical discipline and with other team members. A walkdown of the Unit No. 2 SWS will also be conducted.

The evaluation will be conducted in the following phases:

1. Review the sections of the Unit No. 2 UFSAR and licensing commitments which provide the regulatory commitments for the system. This will establish a basis for familiarization with the system's safety and operational requirements.
2. Review the SWS mechanical and other discipline calculations associated with the systems to determine if the system design bases are supported by calculations or other suitable documentation. Evaluate the design margins provided.

3. Review and compare selected design, procurement, installation, and equipment specifications and verify proper interpretation and consistent use of specified systems and component design conditions associated with plant modifications.
4. Review flow diagrams and piping drawings for consistency with design documents and licensing commitments.
5. Review Modification Packages for consistency with the specification design conditions and adequacy of 10CFR50.59 evaluations.
6. Evaluate single active failure vulnerabilities of the system (Reference Action IV of GL 89-13).
7. Review interfacing systems for effect on SWS operability.
8. Determine if flow balancing has been conducted for various system operating modes.

9. Review current design for potential impact on the original flooding analysis.
10. Review the effectiveness of any design features installed to minimize silting and biofouling of piping and components.
11. Verification of thermal performance.
12. Evaluation of electrical system interfaces to the extent that these interfaces have not been reviewed in other inspections, i.e., EDSFI.

The walkdown of the SWS will evaluate attributes such as interconnection and interactions, as-built configuration, component layout, access for operations, inservice inspection and maintenance, physical separation of components, where applicable, and weather-related considerations.

2.1.2 Specific Area Reviews

Since initial plant operation, there have been occurrences involving the Service Water System

which have necessitated remedial action. The effectiveness of the remedial actions will be reviewed to determine whether the original problem areas have been totally eliminated, or whether further action is necessary. A review of selected Station documents such as Licensee Event Reports concerning the Service Water System over the past years will be conducted to qualitatively assess current availability of the Service Water System.

2.2 Operations Review

The objective of the operations review is to verify that operators can perform the actions necessary to assure that the SWS fulfills its safety functions. This will be accomplished by assessing the adequacy of operating procedures and the availability of system status information such as instrumentation and alarms when operator action is required.

Evaluation of operating procedures will include a review of SWS standard operating procedures, emergency operating procedures, and alarm response procedures. These procedures will be reviewed for adequacy (Reference GL 89-13, Action V), completeness, and consistency with SWS

configuration. The review will also evaluate the impact of modifications on the operator's ability to perform required functions.

The operator training program, lesson plans, and course materials will be reviewed. The review will identify the level of detail the operators are provided in SWS design, safety function, and operation methods. It will also evaluate the timeliness and extent to which SWS modifications are included in the training program.

Operational controls that provide for correct SWS valve alignment and proper functioning of traveling screens will also be assessed.

Lastly, the availability to the operator of essential system status information will be assessed. This status information includes system flows, pressures, temperatures, alarms, etc., which are required for initiation of operator actions. This will be accomplished by reviewing design documents, observing operator locations, e.g., CCR, interviewing Operations personnel, and an in-depth system walkdown (Reference Action IV to GL 89-13). Particular attention will be paid to the availability of system status information when its safety function will be called upon including local operation of equipment.

2.3 Maintenance Review

The objective of the maintenance review is to verify that maintenance of the SWS ensures that the SWS will perform its safety-related functions when called upon.

The review will focus on maintenance necessary to maintain the functional capability of the SWS. Maintenance records will be reviewed to determine if all system safety-related components are included in the maintenance program. Additionally, the maintenance evaluation will supply to, and receive information from, the other evaluation areas to ensure the actual interfaces used to communicate and document the maintenance process are assessed. Examples of these interfaces are activities such as release of equipment for maintenance and evaluation of recurring problems.

The maintenance review will include an evaluation of SWS material condition and related physical characteristics observed during the system walkdown (Reference Appendix D of NRC TI 2515/118), review of applicable documents, interviews of selected maintenance personnel and, if possible, while witnessing maintenance performed on the SWS.

2.3.1 Material condition will be evaluated via direct observation supported by review of documentation such as maintenance history records, station reports, and maintenance work requests. From this, the adequacy of system/equipment maintenance will be determined. These observations will include:

General housekeeping

Leaks/general conditions

Cleanliness/Labeling

Equipment environmental conditions

Erosion/Corrosion (Reference GL 89-13, Action III)

Silting/Biofouling (Reference GL 89-13, Action III)

2.3.2 Maintenance procedures, checklists, etc. which affect selected SWS components will be evaluated for adequacy (Reference 89-13, Action V), completeness, and consistency with vendor

recommendations. The maintenance documents to be reviewed include those that address:

Preventive Maintenance

Corrective Maintenance

Repairs

Maintenance Work Orders

Maintenance Training

Maintenance History

Maintaining Equipment Qualification

Maintaining Plant Design Conditions

2.3.3 Maintenance training records will be reviewed to determine if maintenance personnel are being adequately trained in maintenance processes and procedures and appropriately assigned.

2.3.4 Maintenance evaluations will include any critical components and/or equipment or other components that have experienced high failure rates. The entire maintenance process beginning with the identification of a problem, or other condition, and ending with the closeout of the maintenance work order will be reviewed for selected maintenance activities.

2.4 Surveillance and Testing Review

The objective of the testing review is to verify that surveillance and testing of the SWS demonstrates that the system will perform its safety functions when called upon during all operating conditions.

The evaluation will focus on functional testing of the system and components within the system.

2.4.1 Testing and Surveillance evaluation will begin with the accumulation of design and testing baseline information for the SWS, including:

Initial Preoperational Test Requirements
and Criteria

Technical Specifications

UFSAR

Periodic and Surveillance Test Criteria/
Procedures

Response to GL 89-13 Actions I & II

Plant Drawings

IST Program/Procedures

2.4.2 Selected samples of test results will be evaluated and compared to SWS functional requirements. These include:

Samples of modification package test documents and test data to verify that test requirements were appropriate for the scope of modifications, and acceptance criteria were adequate to verify that modifications to SWS components were properly implemented; and that testing adequately challenged the installed modification and system interfaces.

Samples of completed maintenance work orders will be evaluated to determine if post-maintenance testing requirements were adequate to ensure that components/system have been returned to full operational status.

Implementation and effectiveness of Actions I & II in GL 89-13 will be evaluated.

- 2.4.3 The surveillance and testing reviews will include selected samples of the following components:

Pumps and Drivers

MOVs, Check Valves, Relief Valves

Safety-Related Heat Exchangers

Support Systems

- 2.4.4 Interviews with selected operators, supervisors, maintenance, and engineering personnel will be conducted to complete the evaluation.

2.4.5 Other specific areas to be reviewed include: the effectiveness of testing to identify pipe thinning and flaws, and to verify total flow rates; the adequacy of current test methods to verify that intended results correctly reflect the acceptance criteria; and the verification that surveillance results accurately represent pipe and heat exchanger conditions.

2.5 Quality Assurance, Corrective Actions, and Licensing Commitment Reviews

The objective of these evaluations is to verify implementation of the Quality Assurance program for activities such as: on-site and off-site review committees, corrective action, Technical Specification operability determinations, trending, and quality verification. The technical adequacy and resolution of SWS events and conditions identified by the self-assessments will be reviewed.

These evaluations will also ascertain if the quality verification organizations/functions are staffed and proceduralized to seek, identify, report, and resolve significant problems as indicated by quality verification results.

3.0 ASSESSMENT SCHEDULE

The following will be accomplished prior to start of field assessment:

- o Gather and assemble required documentation, and submit to each reviewer.
- o GET, and Rad Pro training of consultants; badging.
- o Arrange for team work-out room.
- o Team orientation including response team personnel.
- o Checklist completion.

WEEK ONE: Entrance meeting, documentation reviews,
(10/24/94) preliminary familiarization walkdown of SWS,
personnel interviews.

WEEK TWO: Continue assessment activities, review any
(10/31/94) outstanding questions/concerns identified
during week one, prepare RFIs as needed and
issue to responder.

WEEK THREE: Assemble and analyze documentation, review and
(11/7/94) complete or otherwise dispose of RFIs.

WEEK FOUR: Assemble team, review all information
(11/14/94) generated, responses to RFIs, review RFIs, as
necessary, develop draft assessment conclu-
sions.

WEEK FIVE: Review and resolve any outstanding RFIs,
(11/21/94) develop draft Finding and Observation reports.

WEEK SIX: Issue draft Finding and Observation reports to
(11/28/94) responsible management, review and disposition
any responses to draft Findings and Observa-
tion reports, commence drafting audit report,
conduct exit meeting.

Final Report Issue by: 1/12/95

4.0 INSPECTION TEAM RESPONSIBILITIES

4.1 Review Team Leader

The Review Team Leader is responsible for directing the course of the inspection and to keep the inspection focused on the important issues. He will provide

orientation and training to team members on the approach, methodology and overall expectations. The Review Team Leader is responsible for reviewing and approving checklists, supplements, individual review plans and plant responses to all documented concerns. He will promptly advise plant management personnel of potential safety/operability items. The Review Team Leader is responsible for developing a summary report of assessment activities.

4.2 Review Team Member

Each team member will implement an inspection activity for his assigned area in accordance with the approved plan and checklist.

4.3 Response Team Leader

The Response Team Leader is responsible for managing the activities of the response team members and will assist in eliciting timely and adequate responses to review team inquiries. He will highlight problem areas to the Review Team Leader and will assist in the disposition of any issues which have the potential for operability/safety significance.

4.4 Response Team Member

The Response Team Members are responsible to provide a written response to all documented requests or concerns assigned to them during the assessment. The response shall include appropriate disposition for all concerns identified as discrepant.

5.0 TEAM QUALIFICATIONS

Review Team Leader

A Principal Engineer with eighteen years nuclear experience who has been a Review Team Leader on prior system assessments, e.g. Auxiliary Feedwater System & Alternate Safe Shutdown System, has performed technical audits, nuclear fuel design/analysis, safety analyses, and fuel manufacturing audits.

Technical Advisor

A Principal Engineer with over twenty-five years nuclear experience including plant design, installation, modification, repair, replacement steam generator design and installation, maintenance improvements, Engineering Assurance Program, including self-assessments, S.G. girth weld inspection and

repair, Field Engineering supervisor, engineering of power piping, turbines, waste/water treatment, PRA program, and replacement simulator improvement.

Mechanical Design Reviewer

A Senior consultant with over twenty years nuclear experience including 6 years with AE firm, project manager/team leader on SWSOPs, design reviewer on SSOMI teams, PWR system design leader, and preparer of FSAR.

Operations Reviewer

A Mechanical Engineer with ten years nuclear experience, current SRO License, Watch Engineer, RFO test supervisor, failure analyses, HPES coordinator, root cause analyses, investigations, and trending.

QA/QC/Licensing Reviewer

A Principal Engineer with over twenty-five years nuclear experience, including thirteen years with AE firm in system design and Licensing.

Maintenance Reviewer

A Consultant with twenty years of experience, including design, with architect-engineer and consulting firms in the power generation industry. He has participated in numerous self-assessments for nuclear plants including plant maintenance activities.

Surveillance/Testing Reviewer

A Consultant with five years nuclear experience including design, design review and technical auditing, SWOPI team technical reviewer of service water flow and thermal calculations, related surveillance test results including ASME Section XI pump performance testing, and heat exchanger performance testing.

6.0 QUESTION/CONCERN PROCESSING AND CORRECTIVE ACTION

During the assessment, questions or potential concerns shall be documented (see Attachment A - Request for Information (RFI) form) and presented to the appropriate response team member for response. See Figure 1 for the team organization. The time allowed for receiving the response will be determined by the Review Team Leader, and shall be commensurate with the significance of the concern and assessment schedule. The

Review Team Leader will review all concerns with the Technical Advisor to assess their impact on the system's safety function. Conditions and concerns that are potentially safety-significant will be promptly brought to plant management's attention for their action including Nuclear Safety & Licensing (NS&L) assessment of operability and reporting/notification. Responses will be reviewed for adequacy by the originator of the question/concern, the Review Team Leader, and the Team Technical Advisor. Where appropriate, the response should address the type of corrective action taken and/or proposed. Where responses do not resolve potential concerns, discussion with responsible personnel will continue until resolution is achieved. The Review Team Leader has access to all levels of management, but if the concern cannot be resolved prior to the assessment exit meeting, it will be identified and tracked as a Finding or Observation requiring a response, and dispositioned via the Corrective Action Monitoring Program (CAMP) maintained by Nuclear Quality Assurance. All RFIs and documented Findings, Observations and responses will be kept as records of the assessment.

7.0 SELF-ASSESSMENT REPORT

A report will be issued which summarizes all of the areas reviewed, results of the review, and conclusions and recommendations.

8.0 FOLLOW-UP VERIFICATION

Nuclear Quality Assurance will follow-up responses to assessment Findings, Observations and completion of corrective action via the CAMP. Any overdue corrective actions will be promptly reported to management to achieve their timely disposition. See Figure 2 for question/concern processing.

**SERVICE WATER SYSTEM
REQUEST FOR INFORMATION**

TO: _____ Date: _____

FROM: _____ No. RFI- _____

This request is intended to help assure that assessment results accurately reflect the prevailing condition(s) in the area addressed. Your timely and complete response will facilitate this.

ORGANIZATION _____

SUBJECT: _____

Document Request:
Please provide the following documents:

Question/Clarification:
Please respond to the following question/request for clarification:

RESPOND TO:
Please provide your written response to:

_____ (Name) _____ (Phone)

_____ (Location) _____ (Due Date)

RFI COPY DISTRIBUTION:

<input type="checkbox"/> J. Weiss	<input type="checkbox"/> A. Adinolfi	<input type="checkbox"/> T. Walsh
<input type="checkbox"/> J. Curry	<input type="checkbox"/> V. Mullin	<input type="checkbox"/> J. McCann
<input type="checkbox"/> J. Mills	<input type="checkbox"/> C. Jackson	<input type="checkbox"/> _____
<input type="checkbox"/> P. Szabados	<input type="checkbox"/> T. Schmeiser	<input type="checkbox"/> _____

QUESTION / CONCERN RESOLUTION

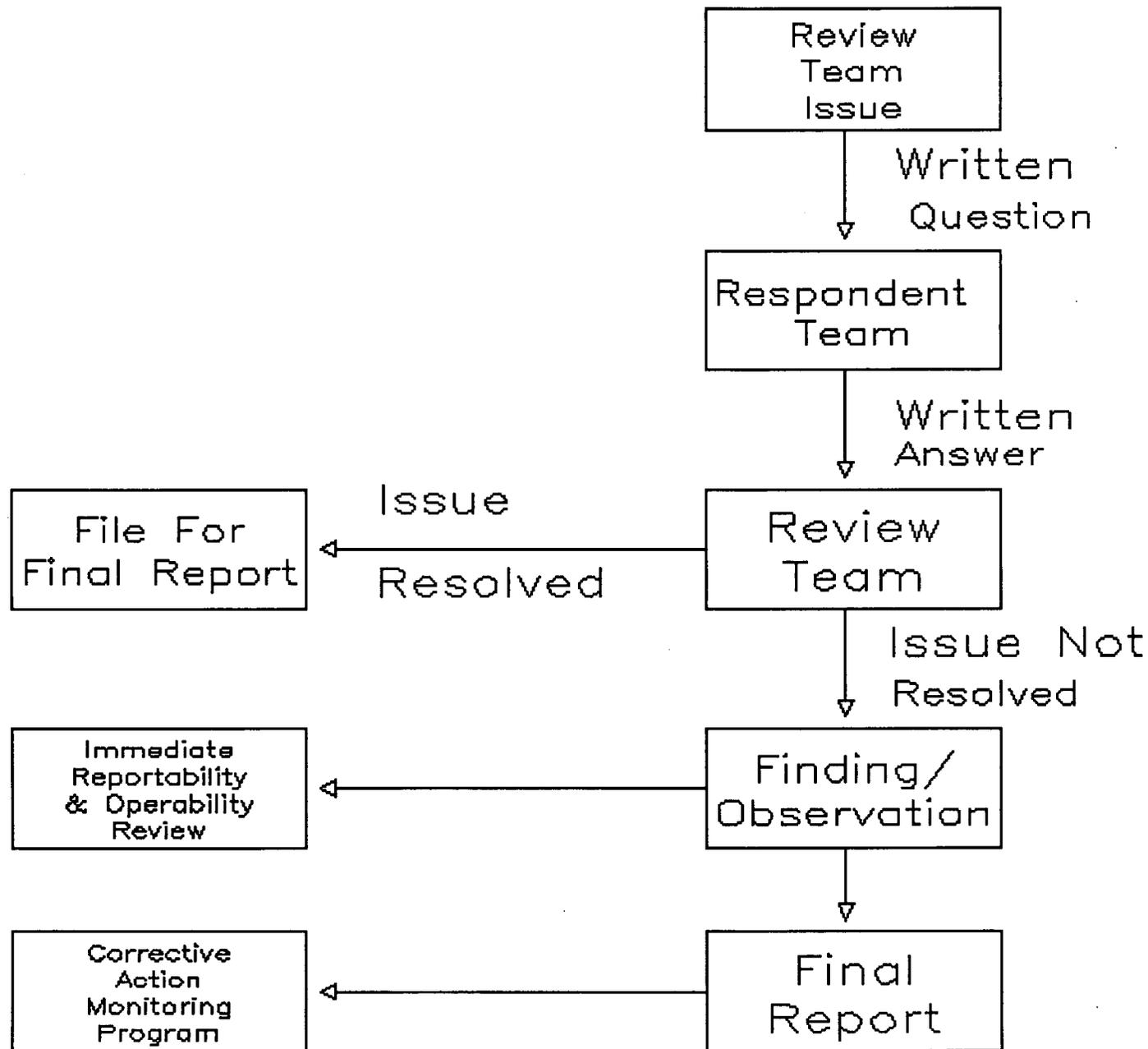


Figure 1

SWOPI SELF ASSESSMENT TEAM ORGANIZATION and INTERFACES

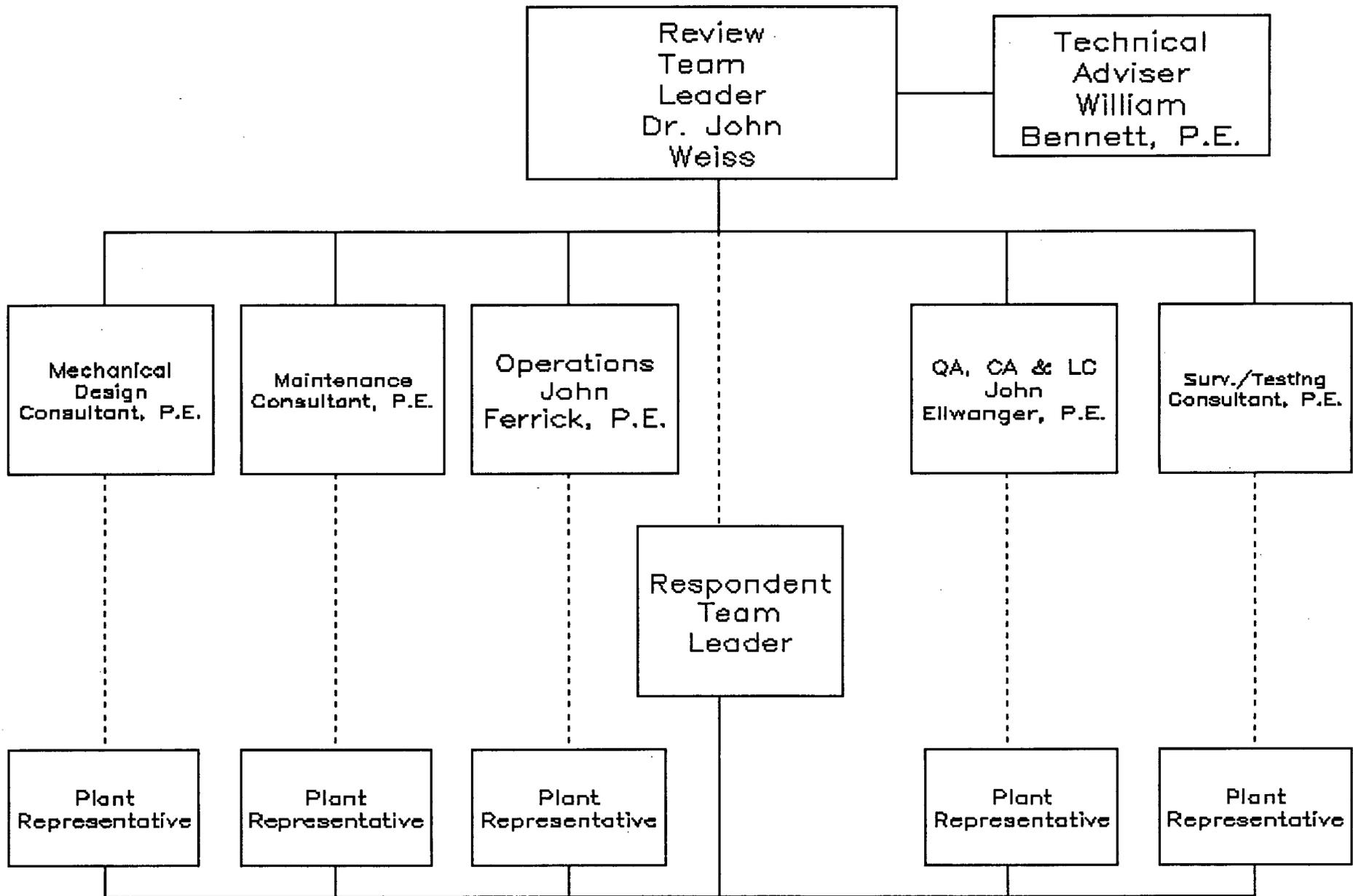


Figure 2