ENCLOSURE 1

Letter from C. A. Schrock (WPSC)

To

Mr. John B. Martin (NRC)

Dated

October 13, 1993

SAFETY SYSTEM FUNCTIONAL INSPECTION PROGRAM

METHODOLOGY AND PLAN

RECOMMENDED BY: D J Ristau 11/20/90

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Asst. Vice President - Nuclear Power

TABLE OF CONTENTS

INTRODUCTION

This document defines a program for the conduct of Safety System Functional Inspections (SSFIs) at the Kewaunee Nuclear Plant. This plan establishes the overall program description, detailed methodology, techniques and processes, for conducting SSFIs of selected plant safety systems.

The objective of the Safety System Functional Inspection (SSFI) Program is to assess the operational readiness of plant safety systems by determining if the systems have been installed, modified, tested, operated, and maintained accordance with the design basis of the system. Completion of this program, including the implementation of any required corrective actions, will provide assurance that selected plant systems are functional and maintained in a state of operational readiness.

The SSFI process utilizes vertical audit methodology tailored to incorporate many of the techniques used in the Nuclear Regulatory Commission's Safety System Functional Inspections and the Institute of Nuclear Power Operation's Performance Evaluations. Plant specific SSFIs are conducted by an Inspection Team with expertise in multiple functional areas. An Implementation Team is responsible for the disposition of all SSFI findings and the implementation of corrective actions. A Senior Nuclear Oversight Team provides corrective action review and management oversight. Program documentation includes a final SSFI Report supported by Request For Information (RI) forms to assure program accountability and auditability.

As suggested by NRC Manual Chapter 2515 Temporary Instruction 2515/78, the Safety System Functional Inspection Program will enhance the existing quality verification organization at Kewaunee by providing technical expertise for the in-depth, achievement oriented, performance based assessment of overall plant quality and operational readiness.

SAFETY SYSTEM INSPECTION PROGRAM

1.0 PURPOSE

The purpose of this program is to provide assurance that plant systems important to safe and reliable plant operation are capable of performing required functions.

2.0 APPLICABILITY

This program applies to the plant safety systems listed in Table 5.2-1 and to associated support equipment necessary to establish operability.

3.0 REFERENCES

3.1 SSFI Scoping Report, December 1987

3.2 NRC Inspection Manual, Chapter 2515, Appendix C, "Safety System Functional Inspection," October 9, 1987.

3.3 NRC Inspection Manual, Chapter 2515, Temporary Instruction 78, "Inspection of Quality Verification Functions." January 12, 1987.

3.4 Wisconsin Public Service Corporation Operational Quality Assurance Program Manual.

3.5 Engineering Control Directive, ECD 14.2, "Safety Systems Functional Inspections."

3.6 Engineering Control Procedure, ECP 14.7, "Disposition of SSFI Minor Discrepancies."

3.7 Engineering Control Procedure, ECP 14.9, "Safety Systems Functional Inspection Document Sheets."

4.0 RESPONSIBILITIES

4.1 Superintendent - Safety System Engineering

The Superintendent - Safety System Engineering acting as Project Manager shall be responsible for programmatic direction and coordination of all SSFI activities and interfaces. The Project Manager shall establish and maintain clear lines of communication and feedback to company management and shall assure that management receives timely and accurate periodic assessments of SSFI progress and findings. The Project Manager shall

provide direct supervisory oversite of the Inspection Team Leader, the Implementation Team Leader and the Administrative Assistant. The Project Manager shall interface directly with the Senior Nuclear Oversight Team.

4.2 Safety System Inspection Supervisor

The Safety System Inspection Supervisor acting as Inspection Team Leader shall be responsible for the overall administration of the Inspection Team's activities. The Inspection Team Leader shall coordinate the timely identification and evaluation of inspection findings through the conduct of daily team meetings. The Inspection Team Leader shall assure that accurate and complete Requests For Information are provided to the Implementation Team for disposition and shall be responsible for the preparation and presentation of the final SSFI report. The Inspection Team Leader shall concur that the RI Responses adequately address the concerns of the RI prior to their being presented to the Senior Nuclear Oversight Team for review.

4.3 Safety System Engineering Supervisor

The Safety System Engineering Supervisor acting as Implementation Team Leader shall be responsible for the overall administration of the Implementation Team's activities. The Implementation Team Leader shall coordinate the review, evaluation, validation, and timely disposition of Requests For Information . The Implementation Team Leader shall provide recommended corrective actions affecting plant hardware, software or personnel resources to the Senior Nuclear Oversight Team for review.

4.4 Safety System Information Coordinator

The Safety System Information Coordinator acting as Administrative Assistant shall be responsible for coordinating the retrieval of design basis documentation required to support SSFI activities. The Administrative Assistant shall assure that SSFI activities pertaining to the identification, acquisition and dissemination of system design basis information are well documented. The Administrative Assistant shall coordinate the detailed tabulation of documents serving as the basis for determining system functionality. The Administrative Assistant shall direct the activities of SSFI clerical staff and shall provide applicable SSFI

accounting activities including invoice management and cost reporting.

4.5 Inspection Team

Inspection Team members shall be responsible for conducting portions of the SSFI as directed by the Inspection Team Leader. Inspection Team members shall perform inspection activities and provide relevant functional area expertise to the team. Inspection Team members shall identify concerns and document the results of the inspection.

4.6 Implementation Team

Implementation Team members shall be responsible for reviewing, prioritizing, evaluating, validating, and dispositioning Requests For Information as directed by the Implementation Team Leader. Implementation Team members shall interface as necessary with plant and corporate nuclear organizations to resolve and provide corrective actions for validated RIs.

4.7 Senior Nuclear Oversight Team

The Senior Nuclear Oversight Team shall be responsible for the review of Request For Information (RI) corrective actions affecting plant hardware, software or personnel resources. The Senior Nuclear Oversight Team shall provide continuing management oversight and cognizance of the SSFI process.

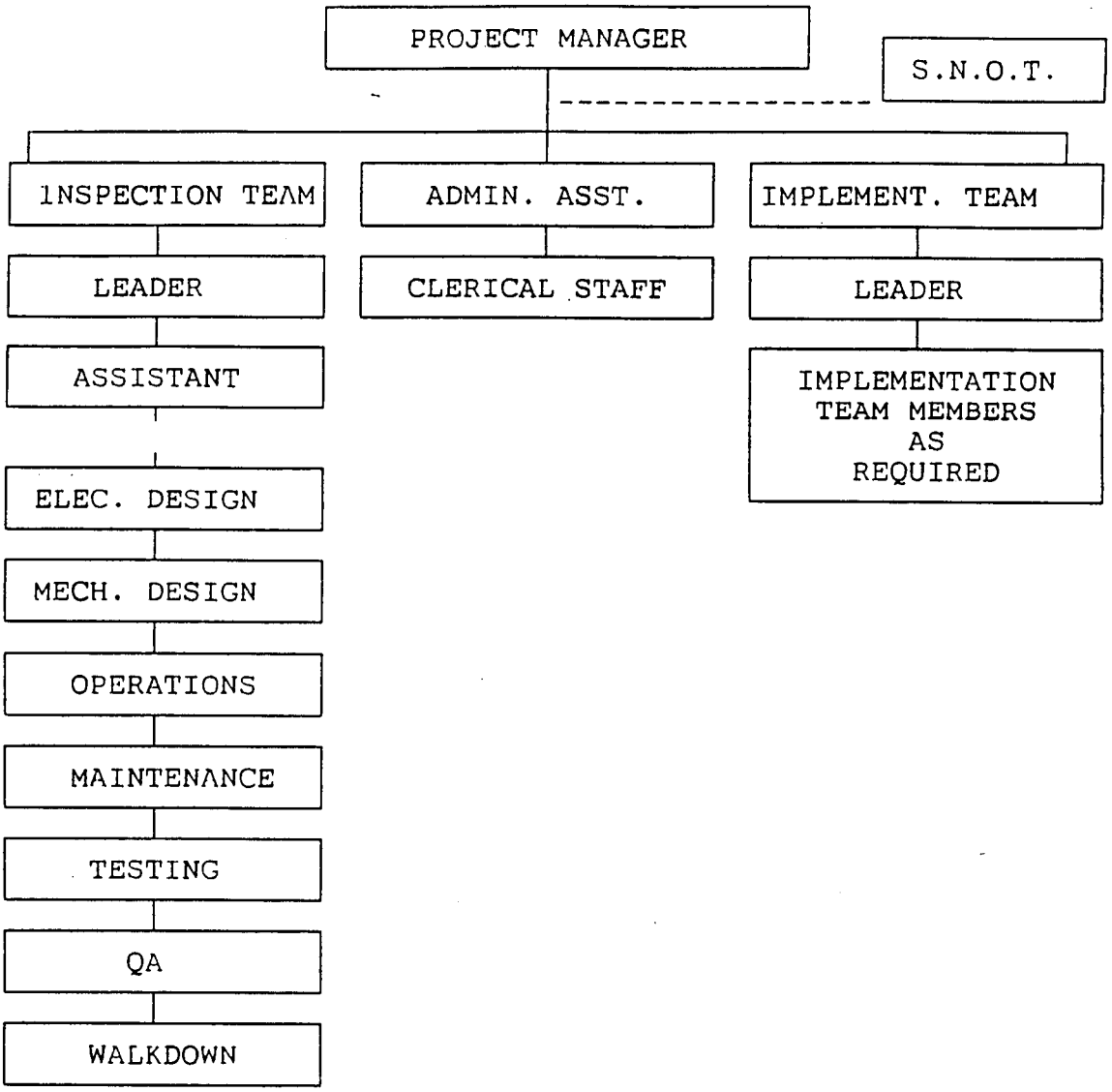
4.8 Managers and Superintendents

Managers and Superintendents are responsible for assuring nuclear group awareness and support of SSFI activities. Managers and Superintendents shall evaluate recommended corrective actions for scheduling and implementation.

4.9 Assistant Inspection Team Leader

The Assistant Inspection Team Leader shall aid the Inspection Team Leader by pre-reviewing Documentation Sheets (Doc Sheets); categorizing minor discrepancies; recommending that an RI be generated when approprlate; and also by maintaining a log of Document Sheets and RIs.

Figure 4.1-1


PROJECT MANAGER
S.N.O.T.
INSPECTION TEAM
ADMIN. ASST.
IMPLEMENT. TEAM
LEADER
CLERICAL STAFF
LEADER
ASSISTANT
IMPLEMENTATION TEAM MEMBERS AS REQUIRED
ELEC. DESIGN
MECH. DESIGN
OPERATIONS
MAINTENANCE
TESTING
QA
WALKDOWN

5.0 SCOPE AND METHODOLOGY

5.1 General

The SSFI Plan is modeled after the vertical audit methodology developed for the NRC's Safety System Functional Inspections. The Safety System Functional Inspection will assess the operational readiness of plant safety systems by determining if:

a. The systems are capable of performing the safety functions required by their design bases.

b. Testing is adequate to demonstrate that the systems will, when required, perform all of the safety functions required.

c. System maintenance is adequate to ensure system functionality.

d. Operations and maintenance personnel training is adequate to ensure proper operation and maintenance of the system.

e. Human factors considerations relating to the system and the supporting procedures for the system are adequate to ensure proper system operation under normal, abnormal, and accident conditions.

f. Management controls including procedures are adequate to ensure that the safety systems will fulfill the safety functions required by their design bases.

g. The original system design was adequate to support its functional requirements.

h. Design Changes have maintained the system functional requirements.

This methodology utilizes a team of technical experts inspecting multiple functional areas to assess the functionality of a plant safety system. The synergy developed within the team through creative questioning, open communication, persistent follow-up, and mutual respect plays a vital role in the evaluation process.

The Inspection Team develops leads which require individual and team effort to investigate. Team members have the flexibility to follow leads as they develop and are not constrained by a mandatory set of require-

ments. The team leader is responsible for prioritizing leads and directing the team to pursue those leads which appear to be most significant. Subsequent to the inspection, the Inspection Team Leader will disposition all Minor Discrepancies and initiate corrective action(s) as deemed appropriate. The Implementation Team dispositions all RIs and initiates corrective actions as deemed appropriate. Management review and oversight are provided by the Senior Nuclear Oversight Team.

5.2 Design Bases

The specific functions to be performed by a structure, system, or component and the specific values or ranges of values chosen for controlling parameters as reference bounds for design. These values may be (1) restraints derived from generally accepted "state-of-the-art" practices for achieving functional goals, or (2) requirements derived from analysis (based on calculation and/or experiments) of the effect of a postulated accident for which a structure, system, or component must meet its functional goals.

5.3 Applicable Systems

Safety System Functional Inspections will be conducted on applicable portions of selected plant safety systems. System selection criteria specified in step 6.2 will be used to prioritize the inspections. The systems, or applicable portions thereof, listed in Table 5.3-1 are considered safety systems.

Table 5.3-1

SAFETY SYSTEMS

For the purpose of SSFIs, the following systems, or applicable portions thereof, are considered safety systems at Kewaunee:

System No.	System Name
01	Station and Instrument Air
02	Service Water
05A	Feedwater
05B	Auxiliary Feedwater
06	Main Steam and Steam Dump
07A	Steam Generator Blowdown
08	Fire Protection
10	Diesel Generator, Mechanical
14A	Auxiliary Building Special Ventilation/Steam Exclusion
16	Turbine Building and Screenhouse Ventilation
17	Auxiliary Building Ventilation
18	Reactor Building Ventiiation
18A	Post-LOCA H2 System
21	Spent Fuel Pool Cooling
23	Containment Spray
24	Shield Building Ventilation
25	Control Room HVAC
31	Component Cooling
32A,B,C,D	Waste Handling Systems
33	Safety Injection
34	Residual Heat Removal
35	Chemical & Volume Control (Including all Heat Tracing)
36	Reactor Coolant
37	Primary Sampling
38	DC Supply & Distribution
39	4160V Supply & Distribution
40	480V Supply & Distribution
42	Diesel Generator Electrical (Includes Safeguards Logic)
45	Radiation Monitoring
47	Reactor Control & Protection
48	Nuclear Instrumentation
49	Control Rod Drive
56	Containment & Containment Isolation
89A	Buildings - Structures

5.4 Inspection Boundaries

The boundaries of a system SSFI shall be defined as follows:

a. The point at which the safety system interfaces with another safety system listed in Table 5.3-1.

b. The point at which the function and reliability of a required auxiliary system is determined to adequately support the functional requirements of the inspected safety system. This may include, but is not limited to , seismic category, QA class, 1E electrical or isolation valve boundaries.

c. The point at which a safety system input or output parameter is determined to be reliable and within the full range of initiation, control and indication required to support system or component functionality.

d. The point at which a plant program is determined to provide the necessary elements to assure that a safety system is adequately installed, maintained, tested and operated, as required within its design bases.

5.5 Functional Areas

The SSFI shall evaluate multiple functional areas in determining the functionality of a plant safety system.

These functional areas include the following:

a. Mechanical design
b. Electrical design
*c. I&C design
d. Operations
e. Maintenance
f. Testing
g. Quality assurance
h. Configuration and material condition
*i. Training and qualifications
*j. System design changes

* Sometimes included with other functional areas

6.0 PROCESS

The SSFI of a plant safety system shall be conducted by a team of qualified technical experts utilizing vertical audit techniques to evaluate the functional areas delineated in Section 5.5 Requests For Information shall be addressed by a second team responsible for resolution and corrective action implementation. An oversight committee of senior nuclear department personnel shall concur with the recommended corrective actions affecting plant hardware, software or personnel resources.

6.1 System Prioritization

The inspection of safety systems, or applicable portions thereof, listed in Table 5.3-1 shall be prioritized.

6.1.1 System prioritization should be based on the following criteria:

6.1.1.1 System safety function, complexity and potential problems

6.1.1.2 Individual Plant Examinations (IPE)

6.1.1.3 Failure history/down time

6.1.1.4 Number of modifications made to the system

6.1.1.5 Number of LERs associated with the system

6.1.1.6 Past systems evaluated by NRC SSFIs

6.1.1.7 Industry experience

6.1.1.8 System uniqueness

6.1.1.9 System installation date

6.1.1.10 Previous reviews conducted

6.1.1.11 Current regulatory issues

6.2 Professional Qualifications

The effectiveness of a SSFI is highly dependent upon the qualifications, composition and "chemistry" of the Inspection and Implementation Teams. The identifica-

tion of substantive potential deficiencies in complex nuclear safety systems and the subsequent recommendation of adequate corrective actions to programmatic and technical issues requires individuals of extensive technical depth and experience.

6.2.1 Members of the SSFI organization should have the following professional qualifications:

6.2.1.1 Project Manager

a. Extensive nuclear related experience

b. Holds a management position

6.2.1.2 Inspection Team Leader

a. Holds a supervisory or management position

b. Previous vertical audit experience

c. A broad nuclear background

d. Previous regulatory or licensing experience

e. Demonstrated ability to evaluate and provide direction and guidance on complex technical issues

f. Demonstrated ability to coordinate teams of technical experts

6.2.1.3 Assistant Inspection Team Leader

a. A broad nuclear background

b. Previous regulatory or licensing experience

c. Demonstrated ability to evaluate and provide direction and guidance on complex technical issues

6.2.1.4 Inspection Team Members

a. Extensive experience to evaluate the adequacy of both administrative programs and system hardware

6.2.1.5 Implementation Team Leader

a. Holds supervisory or management position

b. Broad nuclear related background

c. Demonstrated ability to coordinate responses and corrective actions to complex technical issues

6.2.1.6 Implementation Team Members

a. Demonstrated ability to understand and evaluate complex technical issues in a variety of functional areas.

6.2.1.7 Administrative Assistant

a. Familiar with the processes involved in configuration management

b. Demonstrated ability to organize diverse and numerous items of information

c. Familiar with design basis documents

6.2.1.8 Senior Nuclear Oversight Team Members

a. Holds a management position

b. Extensive nuclear related experience

6.3 Training and Indoctrination

Team members will receive indoctrination and training as needed to provide proficiency and familiarity with the SSFI process.

6.3.1 SSFI Training

6.3.1.1 Members of the Inspection Team shall be trained in the history, methodology, processes and practical factors of the vertical audit.

6.3.1.2 The SSFI curriculum shall be as specified in Table 6.4-1.

6.3.1.3 SSFI training shall be conducted by an instructor with previous vertical audit experience.

TABLE 6.3-1

SSFI TRAINING CURRICULUM

Course Introduction

Vertical Audit Historical Development and Methodology

Vertical Audit Process

Design Basis Considerations

Case Studies

Documentation

6.3.2 SSFI Indoctrination

6.3.2.1 Inspection Team members shall receive SSFI indoctrination prior to initiating SSFI activities.

6.3.2.2 Indoctrination should consist of the following as necessary:

a. Aspects of the SSFI process including purpose, organization, scope, approach, conduct, preparation, documentation, communication, and reporting.

b. Plant administrative, safety, and security requirements

c. Nuclear Power Production organization

d. Plant familiarization tour

6.3.2.3 Members of the Inspection and Implementation Teams shall meet plant training requirements of unescorted access to vital and radiation areas as necessary to perform their functions.

6.4 Preparation

Inspection Team members will review applicable documents to become knowledgeable with system design, arrangement, function, operation, maintenance, testing and regulatory basis. These documents shall be made available by the Administrative Assistant.

6.4.1 Attachment I provides a list of documents to consider for review during the preparation phase.

6.4.2 System design reviews shall be from a functional perspective with emphasis on determining the operating conditions under which each active component will function according to the as-built design during an accident or abnormal condition.

6.4.3 System programmatic reviews shall establish the current operation, maintenance, and testing requirements for the system.

6.4.4 Standards, regulations, codes and guidelines should be reviewed to establish applicable regulatory basis and industry standards.

6.4.5 NRC findings (Industry and plant specific) relative to the inspected system should be reviewed for consideration during the inspection.

6.4.6 Applicable industry events, including INPO documents, NRC bulletins, circular, information notices and generic letters should be reviewed to establish relevant industry operating experience.

6.4.7 Generic RIs which have been developed by previous KNPP SSFIs.

6.5 Meetings

The effectiveness of the SSFI is greatly enhanced if team members interact frequently to benefit from experience and efforts of other team members. To establish this team synergy, team meetings are conducted on a daily basis.

6.5.1 The inspection Team Leader should conduct two team meetings per day - one in the morning and one in the evening.

6.5.2 The morning meeting should address the planned daily activities of each team member and should confirm that team resources are adequately focused on the most significant issues.

6.5.3 The evening meeting should allow each team member to summarize the results of his daily activities, provide any information pertinent to the inspection, and describe potential concerns and issues. Questions, and comments from other team members from various perspectives should be openly encouraged.

6.5.4 The Implementation Team Leader should attend evening

6.5.5 The Senior Nuclear Oversight Team should meet as appropriate to review recommended corrective actions affecting plant hardware, software and personnel resources.

6.6 Approach

6.6.1 Inspection Team

The Inspection Team will consist of 6 or more members, in addition to a Team Leader and Assistant Team Leader. There are general areas that team members should evaluate and certain questions which must be considered in multiple functional areas to assess system operational readiness. The assessment shall include the review of design and vendor documentation, procedures, and training materials; the physical inspection and walkdown of the system; and interviews of personnel. Attachment II lists typical questions and considerations to aid in guiding team members to the appropriate depth required by the SSFI. At the conclusion of the SSFI, each team member shall submit a summary of their inspection activities, as outlined by the Inspection Team Leader.

6.6.1.1 Design

The design evaluation assesses the technical adequacy of the design and design modifications associated with the safety system. This assessment shall concentrate on the functional capability of the system design but may also consider items such as component and material selection. Design team members shall, on a sample basis:

a. Verify that the design basis of the system is correct and considers all operating conditions under which each active component must function during accident and abnormal conditions.

b. Verify that the design calculations are adequate and continue to support all safety functions of the designed system.

c. Verify that the components in the as-built system are installed and tested to meet applicable design and licensing bases.

d. Verify that the modifications incorporated since initial system design and installation have maintained design requirements and did not compromise the ability of the system to meet all intended functional and

performance requirements important to safe and reliable system operation.

6.6.1.2 Operations

The operations evaluation shall assess the adequacy of operational activities in assuring that the system fulfills its intended functions. This assessment should concentrate on operational procedures, operator training and system status information including human factors consideration.

The operations team member shall, on a sample basis:

a. Review the normal, abnormal, emergency, and alarm response procedures including operations administrative control directives and night orders associated with the safety system to determine the adequacy, completeness and consistency with system design requirements.

b. Conduct a line by line review of emergency operation procedures to determine the adequacy of operator actions during postulated events.

c. Evaluate the availability of essential system status information, including flows, pressures, temperatures, etc., which are required for operators to make decisions in initiating actions and responses.

d. Evaluate operator knowledge of recent system modifications for normal, abnormal and emergency operating modes.

e. Evaluate the level of detail and the adequacy of operator training lesson plans and course materials in providing accurate system design basis, operating requirements, system modification information and feedback of industry and plant operating experience.

f. Evaluate the plant Technical Specifications to assure allowed system configura-

tions are consistent with the design basis for all modes of operation.

6.6.1.3 Maintenance

The maintenance evaluation shall assess the adequacy of maintenance activities in assuring that the system is maintained in an functional state. This assessment shall concentrate on preventive and corrective maintenance of the system.

The maintenance team member shall, on a sample basis:

a. Assess the adequacy of deficiency identification and the work request system.

b. Evaluate the adequacy of corrective and preventive maintenance procedures, including the incorporation of vendor recommendations and ALARA considerations for maintaining system components.

c. Assess the adequacy of instrument calibrations in assuring the accuracy of system instrumentation.

d. Review work request backlogs, machinery history records, failure reports, and equipment tending to determine the adequacy of system maintenance.

e. Evaluate the provisions and controls for maintaining equipment qualifications.

f. Evaluate the qualifications of maintenance personnel and the adequacy of maintenance training program lesson plans and course materials to support the difference between procedural details and required skill of the craft.

6.6.1.4 Testing

The system testing evaluation shall assess the adequacy of testing in demonstrating that the system shall perform its intended function during the full range of operating conditions. The testing team member shall, on a sample basis:

a. Evaluate the adequacy of system surveillance and functional test procedures including test configuration, acceptance criteria, and post-test restoration.

b. Evaluate the completeness and correctness of test data.

c. Verify that pre-operational test configurations continue to provide an adequate base line demonstration of system functional requirements considering system modifications since initial start-up.

d. Evaluate the adequacy of post modification and maintenance testing.

6.6.1.5 Quality Assurance

The quality assurance evaluation shall assess management and quality assurance involvement in assuring system functionality.

The quality assurance team member shall, on a sample basis, examine the following areas:

a. Management and department interfaces and channels of communication including responsibility, authority and accountability.

b. Adequacy of contractor and vendor controls.

c. Adequacy of the corrective action program including identification, implementation, closeout and tracking.

d. NRC, INPO, and ANI commitment implementation and tracking.

e. Involvement of plant review groups, the quality assurance organization, managers and supervisors in system activities including in-plant observation and awareness of system status, performance and problems as applicable.

f. Level of industrial safety and commitment to safe working conditions.

6.6.1.6 Material Condition

The material condition evaluation shall assess the configuration and condition of system components. This evaluation shall be accomplished by physical walkdown of the system and visual verification.

The walkdown team member shall:

a. Conduct a 100% verification of readily accessible system configuration including equipment orientation by yellow lining as-built P&IDs.

b. Conduct a 100% verification of readily accessible equipment nameplate data to information contained in the Power Plant Facilities Information System (PPFIS) data base.

c. Verify that the as-found system lineup agrees with procedural requirements.

d. Assess material condition including labeling, housekeeping, material control, lighting and accessibility.

6.6.2 Implementation Team

Discrepancies, concerns and unresolved questions identified by the Inspection Team in a Request For Information shall be dispositioned by the Implementation team.

Implementation Team members shall conduct necessary research, evaluation and interface with plant nuclear organizations to disposition Requests For Information as follows:

a. Invalid - The concerns of the RI are not valid and justification for this disposition is provided for closeout.

b. Valid - No addiitonal information or corrective action is required.

c. Valid - Iformation not available and/or corrective action required.

d. Corrective actions (procedure change, drawing revision, modification, etc.). are recommended for closeout.

6.6.3 Senior Nuclear Oversight Team

The Senior Nuclear Oversight Team shall review recommended corrective actions affecting plant hardware, software, and personnel resources.

The Senior Nuclear Oversight Team shall provide continuing management review and cognizance of the SSFI process.

6.6.4 Administrative Assistant

The Administrative Assistant shall coordinate the retrieval and documentation of design basis information required to support SSFI activities in the documentation areas listed in Table 6.7-1.

The Administrative Assistant shall:

a. Coordinate SSFI activities pertaining to the identification, acquisition and dissemination of system design basis information.

b. Serve as the SSFI liaison with the Configuration Management Program.

c. Tabulate all documents identified as a basis for determining system functionality during the SSFI.

d. Ensure that discrepancies identified in the Design Basis Data Base and System Specific Summary Document are corrected.

e. Maintain the SSFI database

f. Maintain the training records for the SSFI program.

Table 6.6-1

DOCUMENTATION AREAS

Updated Safety Analysis Report - Preliminary Safety Analysis Report (PSAR); original Final Safety Analysis Report with revisions, and Questions and Answers; safety analyses submittals to the NRC and licensing commitments.

Project Design Manual - the original Pioneer Design Manual

System/Logic Descriptions - this includes the original Pioneer system and logic description manuals and the operations system description manual.

Plant Drawings - this includes domestic and vendor drawings, function descriptions and equipment retrieval information.

Equipment Data Base - this includes information maintained in the Power Plant Facility Information System (PPFIS), the Equipment Qualification data base, and the Drawing Data Base Program.

Equipment Nameplate Data - the information available on the equipment nameplate.

Vendor Technical Manuals - equipment instruction manuals provided by the vendor.

Equipment/Purchase Specifications - this includes engineering specifications, dedication practices, and quality typing.

Material Management System - the inventory and equipment spare part control program.

QA Records - construction inspection results, quality control documentation etc.

Calculations - this includes original and mechanical design calculations, instrument setpoint determinations (i.e., Precautions, Limitations and Setpoints Manual), radiation shielding calculations, EQ evaluations, etc.

Operating License and Technical Specifications

Historical Equipment Performance Data - this includes work requests, incident reports, in-service inspections.

Procedures - this is all nuclear procedures including pre-operational test procedures, maintenance procedures, administrative directives, EPIPs, etc.

Planning and Scheduling System - the computerized program for plant task implementation.

Training Material - this includes all training delivery materials: lesson plans, simulator exercise plans, lab exercise guides, self-study guides, qualification check sheet standards, and evaluation materials.

6.7 Processing Requests For Information (RI)

An RI should be initiated for concerns, discrepancies or unresolved question identified by an inspection Document Sheet which are not classified as minor by the Inspection Team Leader. Each RI will be dispositioned as described in Figure 6.8-1.

6.7.1 Initiation

6.7.1.1 The Inspection Team may initiate an RI for one or more of the following cases:

a. A potential technical concern.

b. A significant program aspect or practice which appears to be inadequate or incorrect.

c. Information has been requested but cannot be readily obtained.

d. If several minor discrepancies, when combined, indicate a potential technical or programmatic concern.

6.7.1.2 Each RI shall be:

a. Approved and issued by the Inspection Team Leader.

b. Entered into the RI tracking data base.

c. Evaluated for applicable regulatory and internal reporting requirements.

d. Formally transmitted to the Implementation Team for disposition.

6.7.2 Disposition

6.7.2.1 The Implementation Team shall disposition all RIs.

6.7.2.2 The Implementation Team shall perform a preliminary review and prioritization of the RIs inaccordance with Attachment III.

6.7.2.3 The Implementation Team shall determine if the RI is valid or invalid.

6.7.2.4 If the RI is determined invalid, justification and supporting documentation shall be provided.

6.7.2.5 If the RI is determined valid and requires plant hardware modification or documentation revision, the RI shall be:

a. Evaluated to determine the scope and extent of required modification or revision.

b. Evaluated to determine the cost of recommended corrective actions.

c. Evaluated to determine which nuclear group has responsibility for implementation.

d. Entered into an action item tracking system and assigned an implementation due date.

6.7.2.6 If the RI is determined valid and information is required research and evaluation shall be initiated to determine if the subject information is readily available:

a. If the requested information is available, the information shall be gathered and reviewed as necessary.

b. If the requested information is not available, appropriate analyses, calculations or other efforts as necessary shall be initiated.

6.7.2.7 Each RI response shall be:

a. Approved by the Implementation Team Leader

b. Re-evaluated for applicable reportability requirements.

c. Transmitted to the Inspection Team Leader for evaluation.

d. Reviewed by the Senior Nuclear Oversight Team if corrective actions affect plant hardware, software or personnel resources.

6.7.3 Evaluation

6.7.3.1 The Inspection Team Leader, or his designated alternate shall evaluate and concur with the Implementation Team's response to each RI.

6.7.3.2 If the response is deemed sufficient, then the RI Response shall be returned to the Implementation Team for closeout or presentation to S.N.O.T.

6.7.3.3 If the response is deemed inadequate, the RI shall remain open and shall be returned to the Implementation Team for redispositionor to the project manager for review.

6.7.3.4 In cases where the Implementation Team Leader and Inspection Team Leader do not concur on the adequacy of an RI Response, the Project Manager shall determine response acceptability.

6.7.3.5 If the evaluation indicates potential generic implications, then the RI shall be included in a generic RI file for consideration during subsequent inspections or assigned for programmatic review within the scope of the current or next inspection as deemed appropriate by the Inspection Team Leader.

6.7.4 Review

6.7.4.1 The Senior Nuclear Oversight Team shall review the Implementation Team's disposition of RIs requiring corrective actions affecting plant hardware, software or personnel resources.

6.7.4.2 If the Implementation Team has recommended a corrective action affecting plant hardware, software or personnel resources, upon concurring, the Senior Nuclear Oversight Team shall forward the recommendation to the:

a. Project Manager for budgeting and scheduling;

b. Implementation Team Leader for corrective action initiation and RI closeout.

6.7.5 Request for Information Tracking

The Requests for Information may be tracked to assure proper closeout of concerns and program accountability.

6.7.5.1 All RIs shall be entered into a computerized data base and tracked to closure.

6.7.5.2 RIs shall remain open until one of the following occurs:

a. Justifications demonstrate that the potential concern is invalid.

b. All requested information is provided and is satisfactory.

c. Corrective actions have been implemented and are satisfactory.

d. Recommended corrective actions initiated and entered into another plant tracking system.

6.8 Documentation

Safety System Functional Inspection documentation shall include Inspection Document Sheet forms, Request For Information forms and a final SSFI Report.

6.8.1 Document Sheets

Sufficient documentation of what was inspected and found must be maintained. Notetaking must be clear, legible and logical. The Inspection Team shall document inspection activities on a Document sheet (Ref. 3.7). all potential concerns, deficiencies or unresolved questions identified in the documentation of inspection activities must be identified on an RI or adequately addressed as part of this documentation. Items closed out based only on the Document Sheet shall be categorized at the conclusion of the inspection to assure that no programmatic concerns are evident. All documentation must be detailed and complete to withstand the scrutiny of second party reviews. The disposition of all deficiencies, concerns or

unresolved questions shall be explained in detail on a Minor Discrepancy Response form (Ref. 3.6) and must be identified on the Document Sheet.

6.8.2 Requests For Information

The Inspection Team identifies discrepancies, concerns and unresolved questions throughout the inspection. These items, if not minor in nature, shall be documented, on the Request For Information Form (Ref. 3.7). The Implementation Team shall respond to Inspection Team Requests For Information on a RI Response Form. Implementation Team evaluations may be documented on an Evaluation Sheet.

6.8.3 SSFI Report

At the completion of each Safety System Functional Inspection, a SSFI Report shall be written by the Inspection Team, and reviewed and approved by the Project Manager.

The final SSFI Report shall be submitted to the Vice President-Nuclear Power with copies to the appropriate department managers.

The SSFI Report shall consist of the following:

a. Executive Summary

- A general summary of the inspection.

b. Purpose

- A statement of purpose.

c. Scope

- A discussion of system selection, boundries, schedules, team composition and methodology.

d. Overall Results and Conclusions

- An overview of identified concerns and overall implication and impact on system functionality and operational readiness.

e. Generic Concerns (as applicable)

- An overview of the identified concerns and how as a composite formulate the generic issue.

- A summary of actions(s) being taken to resolve the issue may also be discussed if action(s) has (have) been taken.

f. Specific Concerns

- A specific listing of each concern summarized in one or two sentences.

g. Attachments

I. Documents Reviewed

- A listing of all documents reviewed by the Inspection Team.

- A listing of documents in which design basis information was identified that supports system functionality.

II. Detailed Observations

- A collective grouping of all RIs.

6.9 Independent Review

A technical and programmatic evaluation of the SSFI process shall be conducted to assure program quality and to provide credibility by reducing potential conflicts of interest.

6.9.1 The quality assurance organization shall conduct periodic audits to assure that the SSFI program is being conducted in accordance with this program plan.

6.9.2 An independent technical review shall be conducted periodically. This review shall, on a sample basis, verify that:

a. Inspections are comprehensive

b. Findings are adequately documented and dispositioned

c. Corrective actions are complete and timely

d. Approved procedures which define and govern the SSFI Program are being adhered to.

7.0 CONDUCT

7.1 Safety System Selection

7.1.1 A plant safety system shall be selected by the Inspection Team Leader in accordance with the criteria established in step 6.2.

7.1.2 Preliminary inspection boundaries shall be established in accordance with the criteria in Step 5.4.

7.2 Team Selection

7.2.1 SSFI participants shall be selected in accordance with the professional qualifications established in Step 6.3.

7.3 Pre-Inspection Entrance Meeting

7.3.1 Prior to the initiation of inspection activities, a pre-inspection meeting shall be held with plant management to discuss inspection scope, schedule and conduct.

7.3.2 Minimum SSFI personnel attendance should include the following:

a. Project Manager
b. Inspection Team Leader
c. Implementation Team Leader
d. Administrative Assistant
e. Senior Nuclear Oversight Team

7.4 Inspection Preparation

7.4.1 The Project Manager, Inspection Team Leader and Administrative Assistant shall determine those documents necessary to familiarize the Inspection Team with the system and applicable procedures required to perform the preliminary evaluation of system design and programmatic aspects. Attachment I provides a listing of documents to consider.

7.4.2 The Administrative Assistant shall assure that required documents are available or readily accessible for team member reference.

7.4.3 Members of the Inspection Team shall be or shall have been trained and indoctrinated in accordance with step 6.4.

7.4.4 The Inspection Team Leader shall conduct an initial Inspection Team meeting to discuss administrative and technical details of the SSFI.

7.4.5 The Inspection Team shall review documents as necessary to familiarized themselves with responsible functional areas in accordance with step 6.5.

7.5 Inspection

7.5.1 The Inspection Team shall conduct inspection activities in accordance with Step 6.7.1.

7.5.2 The Implementation Team shall conduct implementation activities in accordance with Step 6.7.2.

7.5.3 The Senior Nuclear Oversight Team shall conduct review activities in accordance with Step 6.7.3.

7.5.4 The Administrative Assistant shall conduct information retrieval and compilation activities in accordance with Step 6.7.4.

7.6 Post-Inspection Exit Meeting

7.6.1 At the conclusion of the SSFI, the Inspection Team Leader shall conduct an exit meeting with plant management to address inspection findings and results.

7.7 SSFI Report

7.7.1 The Inspection Team shall document findings and results in a final SSFI report in accordance with Step 6.9.

7.7.2 The Inspection Team Leader shall submit the final SSFI Report to the Project Manager within four weeks following the post-inspection exit meeting.

8.0 RECORDS

8.1 The SSFI report and Requests For Information shall be maintained as Quality Records pursuant to the requirements of the Operational Quality Assurance Program.

9.0 ATTACHMENTS

ATTACHMENT I
DOCUMENTATION REVIEW

A "standard" list of design associated documents that the team members would need to prepare for an SSFI follows:

System Descriptions

Applicable Technical Specs

Documentation Files

Vendor Drawings

Equipment Qualifications (EQ) Lists

Design Calculations

Plant-related Software

Setpoint Document

As Designed Drawings

In-Service Inspection (ISI) Lists/Data Bases

Design Criteria Documents

Administrative Control Directives

Post-Maintenance and Post-Modification Requirements

Quality Assurance Directives

Reg. Guide 1.97 List

NUREG 0612 Plan (Heavy Loads)

NUREG 0737 (TMI Modifications)

FSAR (applicable chapters and chapter 14)
Computer I/O Lists:

1. Plant Process Computer-Analog 2.Plant Process Computer Digital 3.SPDS-Analog 4.SPDS-Digital

Seismic Files

Maintenance Procedures

Circuit Breaker List

Detailed Control Room Design Review (DCRDR)

Spare Parts List

Specifications

Cable and Raceway Schedules

Accident Analyses

Fire Hazards Analyses

Vendor Manuals

As Constructed Drawings

NSSS Supplier Drawings

In-Service Inspection (ISI) Program

Operating Procedures (normal, abnormal, emergency)

Data Bases
1. Equipment List
2. Instrument List
3. Valve List
4. Pipe Line List

Licensing Correspondence
Commitment Tracking

ATTACHMENT II

ITEMS FREQUENTLY CHECKED DURING SAFETY SYSTEM FUNCTIONAL INSPECTIONS

These are phrased as either questions to ask or areas to evaluate.

Calculations:

Assumptions:

Are they realistic?

Are they justifiable?

Are they specific or too broad?
(example: using an average fluid density value without regard for actual temperatures)

Calculations:

Methodology:

Is it appropriate methodology to use?

Are conversion factors correct?

Are SU transformer impedances in calcs?

Consideration of MOV starting currents as part of initial design loads.

Check calcs for engineering judgements.

Check calcs to determine their accuracy in reflecting as-built plant.

Check Valves:

Have they been checked for tightness?

Are they tested?

Are they in the PM program?

Are they adequate for their use (excess flow check valves)?

Are flow check valves used properly?

Are valves adequately sized?

How will failures affect the system?

Battery:

Are temperatures considered in the design process?

Are room temperatures above minimum design specified?

Are the batteries sized correctly?

Maintained per Vendor recommendations?

Equalizing and discharge tests conducted correctly?

Specific gravities properly taken and corrected?

Reserve capacity?

Loading?

Effect on inverters reviewed?

What is the maint. history on the battery?

Electrical Distribution:

Are components within their period of useful life? (e.g., power filter capacitors)

What are the electrical load schedules?

What alarms when loads are lost? (e.g., 480 VAC load)

Voltage available at the component.

Cable sizing?

Ampacity considerations?

Continuous and short circuit duty?

Consideration of test type data.

Check breaker sizes for adequacy.

Overload protection?

Overload alarms?

Feeder cable voltage drops?

Thermal insulation adequate?

Inverters and inverter loads?

Justifications for reduction of safety-related loads.

Are EQ records available?

DC system power distribution correct?

Do data sheets point out special entries?

Leads and jumpers properly placed?

Will the EDG provide power under DBA and Survail Test?

How are breaker positions verified?

Are protective relays in calibration program?

Check calibration procedures.

Does Control Room have one-lines and diesel electric drawings?

Check load shedding surveillances.

Check auto sequencing on EDG (all loads).

Does EDG diff. relay have leaking capacitor?

Observe EDG operation.

Check fuse control.

Check overall electrical coordination.

Check room temps (min. & max.) in-EDG & critical areas?

Check general maintenance of electrical systems?

Is there a breaker load list?

Check Governor fluid change out frequency.

Are fuses proper for their duty considering:

a) Arcing time
b) clearing time
c) current limiting
d) I vs. t
f) interrupting rating
g) melting time
h) time-current characteristic
i) voltage rating

Mechanical:

Are relief valves adequately tested and sized?

Are component pressure ratings (pipes, bottles, tanks, pumps) within design specification?

Can components be exposed to overpressure situations?

Vacuum breakers sized and installed correctly?

Valve stroke times trended and corrective actions taken per ASME?

Was proper insulation used? Verify insulation type, (e.g., mirror, calcium silicate, mineral wool, non-asbestos) and location on the subject component or portion of system.

Combining values for multiple spatial components for an earthquake.

Installation of air cylinder in backup air supply.

Do flow tests actually mimic functional situations?

On what systems does the safety system rely for support?

Is piping adequately sized for flow, pressure and temp conditions?

Have MOV's been tested at maximum system differential pressure?

Pumps:

Susceptible to run-out?

NPSH adequately considered and correct?

Are flow testing methods adequate?

Are the test measurements accurate enough?

Are overspeed precautions needed to start or stop (e.g., time between successive starts, having to secure starting the other, etc.)?

Pump packing procedures?

On steam driven pumps: flow, pressure and temp in spec?

What are the ramifications of long-term operation?

What is the maintenance history of pump?

Setpoints:

Are throttle valves correctly set?

Are computer setpoints correct?

Are alarm setpoints justifiable?

Are Reactor Protection and Emergency Safeguard features actuation, bypass and interlock setpoints adequate?

Do safety margins account for instrument and test equipment inaccuracies, and loop timing?

Measurements:

Insulated versus uninsulated instrument lines.

Signal accuracy and range requirements meet to ensure calibration?

Temperature corrections.

Nitrogen System:

Is Nitrogen backup safety-related?

Is there sufficient capacity to meet cycling needs?

Is pressure properly set?

Has the system been fully tested?

Motor Operated Valves:

Are torque switch settings specified and set correctly?

Are limit switch settings correct?

Maintenance of MOVs poor due to dirt, missing caps?

Proper power source?

Proper maintenance procedure per tech manual?

What is the performance history of MOVs?

Other:

Is there evidence of <u>independent</u> design reviews?

Are procedure referenced current and available (design documents)?

Are all positions of a switch tested?

Sensing line single failure impacts?

Comparison of fabrication drawings to installation?

Potential leakage paths in air systems?

Check controlled drawings for accuracy (incorrect valve positions and locked positions).

Coordination of post-mod and surveillance tests.

Instrument Index errors/omissions.

Isolation of Control Room. (Remote shutdown)

Preventive maintenance program.

What is physical appearance of system components?

Have personnel been properly trained to procedures?

Have 50.59 evaluations covered all safety questions?

How are safety classifications determined?

IE, INPO & LER bulletins reviewed?

Check communication practices!

Check vendor requirements for component PM and surveillance.

Check human factors!

Check alarm procedures for loss of power or blown fuses.

For special cases such as safety relief valve tail pipes, are nominal circumferences of the pipe correct?

Does valve operator orientation correspond i the piping drawings? Orientation (horizontal, vertical, 45 degrees).

Are components (i.e., valves, pumps, strainers vessels, tanks, flow elements, orifices, etc.) branch connections (i.e., tees, laterals, drain and vents, etc.) in the proper relative order as specified on the diagram/drawing?

Interconnected flow paths should be verified up to the first component of the flow path.

Does nameplate data for valves, pumps, and other components match design calculations? Example of the data that may be found on the nameplate are as follows:

a. Manufacturer's name and address.

b. ASME code symbol stamp, class and year built.

c. National board number.

d. Manufacturer's component identification such as serial or mark numbers.

e. ANSI pressure class rating.

f. Design and testing conditions such as pressure and temperature.

g. Size or capacity.

Maintenance Work Request:

Are all required signatures in place?

ARe 50.59 safety evaluations included in package required?

Are Work Requests properly classified?

Were work instructions clear and adequately detailed?

Were revisions, omissions, alterations to work instructions etc. properly made?

Were test acceptance criteria specified?

Were test acceptance criteria met?

Were test results evaluated and accepted?

Was the test performed adequate?

Is test equipment verifiable?

Were Post Work Request Test/Surveillance requirements in package?

Was installed material properly stored and maintained?

Were materials used properly classified?

Were materials properly ordered?

Were materials properly received?

Were specifications met?

If required, was the material properly dedicated?

Did temporary, alterations have a Safety Evaluation and on-site approval?

If there are any special quality requirements, have thy been identified?

Is the performance of an ALARA review been documented?

Are there any posted operator aids in the area?

Are they controlled?

Are instruments properly labeled and of correct range?

Are locking devices provided and used where appropriate?

Are relief valves engaged?

Is discharge directed away form equipment?

Are fire barriers installed as designed?

Are cable bend radius, separation, termination of cables acceptable?

Is any open equipment properly protected?

Is foreign material exclusion practices acceptable?

Are there any unused hangers, pipes, etc?

Modifications:

Were 50.59 Safety Evaluations in the modification package?

Is 50.59 complete and adequate?

Were modifications testing/surveillance requirements specified?

Were test requirements met?

Were test results evaluated and accepted?

Was testing adequate?

Have temporary alterations received a 50.59 review and appropriate on-site approval?

Does the modification packages include an engineering synopsis?

Were revisions, omissions, alterations to work instructions properly made?

Was installed material properly classified?

Was installed material properly ordered?

Was installed material properly received?

Did installed material meet specifications?

Were field checks performed?

Was the modification installed per the plan?

Were requisite design documents updated?

Was necessary training indicated and performed for operations and/or maintenance?

Was requisite training adequate?

Was training timely?

Is associated paperwork traceable?

Was installed material properly stored and maintained?

Are calculations provided in the modification package, if required?

Are calculations adequate?

Does the modification package include a final document checked and is it complete?

Are post approval revision to work instructions reapproved?

If there are any special quality requirements, have they been identified?

Was there acceptable classification of modification ASME Section III, safety related, non-safety related).

Is engineering judgement exercised in the design analysis appropriately documented?

Was an independent design review/verification performed for the modifications?

For modifications that could not be completed as originally designed, did the engineer determine if the incomplete condition satisfied the original 10CFR50.59 safety evaluation and if not, revised it?

For the modifications engineered by the Architect Engineer, were controlled design documents issued by the Architect Engineer(s) to support the design analysis and the adequacy of modification?

Were design documents (i.e., electrical drawings, specifications, system description, piping lists, etc.) which require revision as a result of a modification identified and revised?

Have the construction drawings/design documents released for the modification been identified, either in the mod. approval letter or by reference to the design package?

For modifications engineered by an Architect Engineer, was an acceptable design review performed by the utility and appropriately documented?

Were documented technical justifications provided for changes to original modification?

Was NRC approval requested for modifications involving a change to the operating license which includes the change to Tech Spec, or an unreviewed safety question?

Were computer calculations if generated, controlled and adequately identified including computer type, code or programming, inputs and outputs?

Were design specifications referenced as design inputs in the engineering analysis for the modification updated and controlled?

General Walkdown Considerations:

Are components labeled?

Are labels correct?

Are handwheels, gland fasteners, gage faces, etc. missing?

Are instruments calibrated?

Do vent and drain lines have caps?

Are components in proper position for mode of operation?

Does component ID and checklist agree?

Is the system installed per latest approved plans?

Does the installed system agree with the system line-up checklist?

Do fasteners have proper thread engagement?

Are washers installed?

Are hangers properly assembled and supporting the system?

Are valves (check valves, etc.) installed in proper orientation?

Are observable EQ splices proper?

Are components properly secured?

Cleanliness?

Component conditions of rust, leaks, etc.?

Is emergency equipment in area operable (fire protection, lighting, etc.)?

Are jumpers or temporary Mods installed?

Are they authorized?

ATTACHMENT III

RI PRELIMINARY REVIEW AND PRIORITIZATION

SIGNIFICANCE CRITERIA:

1. Potential Operability or Reportability concern(s) - immediate attention required. Evaluation should be completed within 14 days.*

2. Potentially significant concerns(s) - warrants expedited evaluation. Evaluation should be completed within 45 days.*

3. General concern(s) - evaluate through normal process. Evaluation should be completed within 1 year.*

4. Broad based or Programmatic concern(s) - evaluate as programmatic or related issues are exposed and information becomes available. Evaluation should be completed within 18 months.*

CORRECTIVE ACTION CRITERIA:

A. Expedited modification, analysis, offsite engineering, or changes to plant practices expected.

B. Normally processed modification, analysis, offsite engineering, or changes to plant practices expected.

C. Long term programmatic actions expected.

D. No corrective actions expected.

* Evaluation times are measured from the date the SSFI report is issued. Completion of the evaluation will consist of validating and assessing the RI concern(s); formulating recommended corrective actions if any are required; and transmitting the evaluation to the Implementation Team Leader. RI priority will be based on the most significant concern for each RI but may be revised when that concern is resolved, or when additional information becomes available. Changes in prioritization should be noted by updating the RI Preliminary Review and Prioritization Form. Extensions of the response times shall be approved by the Superintendent Safety System Engineering.