Audit and Review Plan for Plant Aging Management Programs and Reviews

Palisades Nuclear Plant
Docket No.: 50-255

June 3, 2005

Revision 0

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Prepared for
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Office of Nuclear Reactor Regulation
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Palisades Nuclear Plant Audit and Review Plan

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1. Introduction

By letter dated March 22, 2005 (ADAMS Accession Number ML050940434), Nuclear Management Company (NMC, the applicant) submitted to the U.S. Nuclear Regulatory Commission (NRC) its application for renewal of Operating License DPR-20 for Palisades Nuclear Plant (PNP) (ML050940446). The applicant requested renewal of the operating license for an additional 20 years beyond the 40-year current license term.

In support of the staff's safety review of the license renewal application (LRA) for the Palisades Nuclear Plant (PNP), the License Renewal and Environmental Impacts Program, Section B (RLEP-B), will lead a project team that will audit and review selected aging management reviews (AMRs) and associated aging management programs (AMPs) developed by the applicant to support its LRA for PNP. The project team will include both NRC staff and engineers provided by Information Systems Laboratories, Inc. (ISL), RLEP-B's technical assistance contractor. Appendix A, "Project Team Membership," lists the project team members. This document is the RLEP-B plan for auditing and reviewing plant aging management reviews and aging management programs for PNP.

The project team will audit and review its assigned AMPs and AMRs against the requirements of Title 10 of the *Code of Federal Regulations*, Part 54 (10 CFR Part 54), "Requirements for Renewal of Operating Licenses for Nuclear Power Plants;" the guidance provided in NUREG-1800, "Standard Review Plan for Review of License Renewal Application for Nuclear Power Plants" (SRP-LR), dated July 2001; the guidance provided in NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," dated July 2001; and this plan. For the scope of work defined in this audit plan, the project team will verify that the applicant's aging management activities and programs will adequately manage the effects of aging on structures and components, so that their intended functions will be maintained consistent with the PNP current licensing basis (CLB) for the period of extended operation.

The team will perform its work at NRC Headquarters, Rockville, Maryland; at ISL's offices in Rockville, Maryland; and at the PNP site in Covert, Michigan. The project team will perform its work in accordance with the schedule shown in Appendix B, "Schedule." The team will conduct a public exit meeting at or near the applicant's offices in Covert, Michigan, after it completes its on-site work.

This plan includes the following information:

- **Introduction and Background**. Summary of the license renewal requirements, as stated in the *Code of Federal Regulations,* and a summary of the documents that the project team will use to conduct the audit and review process described in this plan.

- **Objectives**. The objectives of the audit and review addressed by this plan.

- **Summary of Information Provided in License Renewal Application**. Description of the information contained in the license renewal application for PNP that is applicable to this plan.

- **Overview of the Audit, Review and Documentation Procedure**. Summary of the process the project team will follow to audit and review the LRA information that is within its scope of review.

- **Planning, Audit, Review and Documentation Procedure**. The procedure that the project team will use to plan and schedule its work, to audit and review the LRA information that is within its scope of review, and to document the results of its work.

- **Appendices**. Supporting information. The project team membership is shown in Appendix A and the schedule is shown in Appendix B. The team's work assignments are shown in Appendix C, "Aging Management Program Assignments," and Appendix D, "Aging Management Review Assignments." Appendices E, F, and G contain the worksheets that the individual team members use to informally document the results of their review and audit work. The application of these worksheets is discussed in Section 6 of this plan. Appendix H is a list of the acronyms, abbreviations, and initialisms used in this plan.

2. Background

In 10 CFR 54.4, the scope of license renewal is defined as those structures, systems, and components (SSCs) (1) that are safety-related, (2) whose failure could affect safety-related functions, and (3) that are relied on to demonstrate compliance with the NRC's regulations for fire protection, environmental qualification, pressurized thermal shock, anticipated transients without scram, and station blackout. An applicant for a renewed license must review all SSCs within the scope of license renewal to identify those structures and components (SCs) subject to an AMR. SCs subject to an AMR are those that perform an intended function without moving parts or without a change in configuration or properties (passive), and that are not subject to replacement based on qualified life or specified time period (long-lived). Pursuant to 10 CFR 54.21(a)(3), an applicant for a renewed license must demonstrate that the effects of aging will be managed in such a way that the intended function or functions of those SCs will be maintained, consistent with the CLB, for the period of extended operation. 10 CFR 54.21(d) requires that the applicant submit a supplement to the final safety analysis report (FSAR) that contains a summary description of the programs and activities that it credited to manage the effects of aging during the extended period of operation.

The SRP-LR provides staff guidance for reviewing applications for license renewal. The GALL Report is a technical basis document. It summarizes staff-approved AMPs for the aging management of a large number of SCs that are subject to an AMR. It also summarizes the aging management evaluations, programs, and activities acceptable to the NRC staff for managing aging of most of the SCs used in commercial nuclear power plants, and serves as a reference for both the applicant and staff reviewers to quickly identify those AMPs and activities that the staff has determined will provide adequate aging management during the extended period of operation. If an applicant commits to implementing these staff-approved AMPs, the time, effort, and resources needed to review an applicant's LRA will be greatly reduced, thereby improving the efficiency and effectiveness of the license renewal review process. The GALL Report identifies (1) systems, structures, and components, (2) component materials, (3) the environments to which the components are exposed, (4) the aging effects associated with the materials and environments, (5) the AMPs that are credited to manage the aging effects, and (6) recommendations for further applicant evaluations of aging effects and their management for certain component types.

The GALL Report is treated in the same manner as an approved topical report that is generically applicable. An applicant may reference the GALL Report in its LRA to demonstrate that its programs correspond to those that the staff reviewed and approved in the GALL Report. If the material presented in the LRA is consistent with the GALL Report and is applicable to the

applicant's facility, the staff will accept the applicant's reference to the GALL Report. In making this determination, the staff considers whether the applicant has identified specific programs described and evaluated in the GALL Report but does not conduct a re-review of the substance of the matters described in the GALL Report. Rather, the staff confirms that the applicant verified that the approvals set forth in the GALL Report apply to its programs.

If an applicant takes credit for a GALL AMP, it is incumbent on the applicant to ensure that the plant AMP contains all the program elements of the referenced GALL AMP.[1] In addition, the conditions at the plant must be bounded by the conditions for which the GALL AMP was evaluated. The applicant must certify in its LRA that it completed the verifications and that they are documented on-site in an auditable form.

3. Objectives

The overall objective of the audit and review described in this plan is to verify compliance with 10 CFR 54.21(a)(3). Therefore, the audit and review process helps ensure that for each structure and component within the scope of the project team's review, the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation.

The audit and review procedure for PNP is described in Sections 5 and 6 of this plan. It is intended to accomplish the following objectives:

- For plant AMPs that the applicant claims are consistent with GALL AMPs, verifying that the plant AMPs contain the program elements of the referenced GALL AMP (for the seven program elements that are within the scope of review of the project team) and that the conditions at the plant are bounded by the conditions for which the GALL AMPs were evaluated.

- For plant AMPs that the applicant claims are consistent with GALL AMPs with exceptions, verifying that the plant AMPs contain the program elements of the referenced GALL AMPs and that the conditions at the plant are bounded by the conditions for which the GALL AMPs were evaluated. In addition, verifying that the applicant has documented an acceptable technical basis for each exception.

- For plant AMPs that the applicant claims will be consistent with GALL AMPs after specified enhancements are implemented, verifying that the plant AMPs, with the enhancements, will be consistent with the referenced GALL AMPs, or are acceptable on the basis of a technical review. In addition, verifying that the applicant identified the enhancements as commitments in the Final Safety Analysis Report (FSAR) or other docketed correspondence.

[1] Table 1 of this plan shows the 10 program elements that are used to evaluate the adequacy of each aging management program. These program elements are presented in Branch Technical Position (BTP) RLSB-1, "Aging Management Review - Generic," in Appendix A of the SRP-LR, and are summarized in the GALL Report. The project team's scope of review includes 7 of the 10 elements: 1 through 6, and 10. The Division of Inspection Program Management (DIPM), Office of Nuclear Reactor Regulation (NRR) will review program elements 7, "corrective actions;" 8, "confirmation process;" and 9, "administrative controls." Therefore, the project team will not review these three elements. The DIPM review will be documented in Section 3 of the license renewal safety evaluation report for the plant.

- For plant-specific AMPs that the applicant claims are consistent with AMPs that the staff has previously approved for another plant, verifying the AMPs are acceptable on the basis of a technical review.

- For AMRs that the applicant claims are consistent with the GALL Report, verifying that the plant AMRs are consistent with the criteria of the GALL Report or can be accepted on the basis of an NRC-approved precedent.

- For AMR line items for which the GALL Report recommends further evaluation, verifying that the applicant has addressed the further evaluation, and evaluating the AMRs in accordance with the SRP-LR.

4. Summary of Information Provided in the License Renewal Application

The PNP LRA closely follows the standard LRA format presented in NEI 95-10, "Industry Guideline for Implementing the Requirements of 10 CFR Part 54 – The License Renewal Rule," Revision 3, April 2001. Section 3 of the LRA provides the results of the aging management review for structures and components that the applicant identified as being subject to an aging management review.

LRA Table 3.0-1 provides a description of the service environments used in the AMRs to determine the aging effects requiring management. Results of the AMRs are presented in two different types of tables. The applicant refers to the two types of tables as Table 1 and Table 2.

The first table type is a series of six tables labeled Table 3.X.1, where "X" is the system/component group number (see table below), and "1" indicates it is a Table 1 type. For example, in the reactor coolant system subsection of the LRA Section 3, this is Table 3.1.1, and in the engineered safety features subsection of LRA Section 3, this is Table 3.2.1.

X	Definition
1	Reactor Coolant System
2	Engineered Safety Features
3	Auxiliary Systems
4	Steam and Power Conversion System
5	Containments, Structures, and Component Supports
6	Electrical and Instrumentation and Controls

The second table type is a series of tables labeled Table 3.X.2-Y, where "X" is the system/component group number, "2" indicates it is a Table 2 type, and "Y" indicates the subgroup number within group "X". For example, within the "reactor coolant system" (group 1), the AMR results for the primary coolant system (subgroup 1) are presented in LRA Table 3.1.2-1, and the results for the reactor vessel (subgroup 2) are presented in LRA Table 3.1.2-2. Under the "engineered safety features" (group 2), the engineering safeguards system (subgroup 1) results are presented in Table 3.2.2-1 of the LRA.

The applicant compared the PNP AMR results with information set forth in the tables of the GALL Report and provided the results of its comparisons in two table types that correlate with the two table types described above.

LRA Tables 3.1.1 through 3.6.1 (Table 1 types) provide a summary comparison of how the PNP AMR results align with Tables 1 through 6 of the GALL Report, Volume 1. These LRA tables are essentially the same as Tables 1 through 6 of the GALL Report, Volume 1, except that the "Type" column has been replaced by an "Item Number" column, the GALL Volume 2 Item Number column has been deleted, and a "Discussion" column has been added. The "Item Number" column provides a means to cross-reference between an LRA Table 3.X.2-Y (Table 2 type) and an LRA Table 3.X.1 (Table 1 type). The "Discussion" column includes further information. The following are examples of information that might be contained within the "Discussion" column:

- Any "Further Evaluation Recommended" information or reference to the location of that information.
- The name of a plant-specific program being used.
- Exceptions to the GALL Report assumptions.
- A discussion of how the line item is consistent with the corresponding line item in the GALL Report, when it may not be intuitively obvious.
- A discussion of how the line item differs from the corresponding line item in the GALL Report, when it may appear to be consistent.

LRA Table 2 types provide the detailed results of the AMRs for those SCs that are subject to an aging management review. There is a Table 2 for each subgroup within the six system/component groups. For example, the engineered safety features group contains a table specific to the engineering safeguards system. Table 2 of the LRA consists of the following nine columns.

- *Component Type.* Column 1 identifies the component types that are subject to an AMR. The component types are listed in alphabetical order. In the structural tables, component types are sub-grouped by material.
- *Intended Function*. Column 2 identifies the license renewal intended functions for the listed component types. Definitions and abbreviations of intended functions are listed in Table 2.1-1 in Section 2 of the LRA.
- *Material*. Column 3 lists the particular materials of construction for the component type being evaluated.
- *Environment*. Column 4 lists the environment to which the component types are exposed. Internal and external service environments are indicated. A description of these environments is provided in LRA Table 3.0-1.

- *Aging Effect Requiring Management*. Column 5 lists the aging effects identified as requiring management for the material and environment combinations of each component type.

- *Aging Management Programs*. Column 6 lists the programs used to manage the aging effects requiring management.

- *NUREG-1801 Volume 2 Line Item*. Each combination of the following factors listed in LRA Table 2 is compared to the GALL Report to identify consistencies: component type, material, environment, aging effect requiring management, and aging management program. Column 7 documents identified consistencies by noting the appropriate GALL Report item number. If there is no corresponding item number in the GALL Report for a particular combination of factors, Column 7 is left blank.

- *LRA Table 1 Item*. Each combination of the following that has an identified GALL Report item number also has a Table 1 line item reference number: component type, material, environment, aging effect requiring management, and aging management program. Column 8 lists the corresponding line item from Table 1. If there is no corresponding item in the GALL Report (Volume 1), Column 8 is left blank.

- *Notes*. Column 9 contains notes that are used to describe the degree of consistency with the line items in the GALL Report. Notes that use letter designations are standard notes based on the letter from A. Nelson, NEI, to P. T. Kuo, NRC, "U.S. Nuclear Industry's Proposed Standard License Renewal Application Format Package, Request NRC Concurrence," dated January 24, 2003 (ML030290201).[2] These standard notes are shown in Table 2 of this plan. Notes that use numeric designators are specific to PNP.

LRA Table 2 contains the aging management review results and indicates whether the results correspond to line items in Volume 2 of the GALL Report. Correlations between the combination in LRA Table 2 and a combination for a line item in Volume 2 of the GALL Report are identified by the GALL Report item number in Column 7. If Column 7 is blank, the applicant did not identify a corresponding combination in the GALL Report. If the applicant identified a GALL Report line item, the next column provides a reference to a Table 1 row number. This reference corresponds to the GALL Report, Volume 2, "roll-up" to the GALL Report, Volume 1, tables. Many of the GALL Report evaluations refer to plant-specific programs. In these cases, the applicant considers the PNP evaluation to be consistent with the GALL Report if the other elements are consistent. Any appropriate AMP is considered to be a match to the GALL program for line items referring to a plant-specific program.

5. Overview of Audit, Review, and Documentation Procedure

The project team will follow the procedure specified in Section 6 of this plan to perform its audits and reviews and to document the results of its work. The process covered by the procedure is summarized below.

[2] The staff concurred with the standardized format for license renewal applications by letter dated April 7, 2003, from P.T. Kuo, NRC, to A. Nelson, NEI (ML030990052).

5.1 Aging Management Programs

Table 1 of this plan summarizes the program elements that comprise an aging management program. Of these 10 elements, elements 1 through 6, and element 10 are within the project team's scope of review.[3] For the PNP AMPs for which the applicant claimed consistency with the AMPs included in the GALL Report, the project team will review the PNP AMP descriptions and compare program elements 1 through 6, and program element 10 for the PNP AMPs to the corresponding program elements for the GALL AMPs. The project team will verify that the PNP AMPs contain the program elements of the referenced GALL program and that the conditions at the plant are bounded by the conditions for which the GALL program was evaluated.

For each PNP AMP that has an exception or an enhancement, the project team will determine whether it is acceptable, and whether the AMP, as modified by the applicant, will adequately manage the aging effects for which it is credited. If the project team identifies differences between a GALL AMP credited by the applicant and the PNP AMP, which the applicant did not address in the LRA, the project team will review the difference to determine whether the PNP AMP, as modified by the difference, will adequately manage the aging effects for which it is credited.

5.2 Aging Management Reviews

The AMRs in the GALL Report fall into two broad categories: (1) those that the GALL Report concludes are adequate to manage aging of the components referenced in the GALL Report, and (2) those for which the GALL Report concludes that aging management is adequate, but further evaluation is recommended for certain aspects of the aging management process. For its AMR reviews, the project team will determine (1) whether the AMRs reported by the applicant to be consistent with the GALL Report are indeed consistent with the GALL Report, and (2) whether the plant-specific AMRs reported by the applicant to be based on a previously-approved precedent are technically acceptable and applicable. For component groups evaluated in the GALL Report for which the applicant claimed consistency with the GALL Report, and for which the GALL Report recommends further evaluation, the project team will review the applicant's evaluation to determine if it adequately addressed the issues for which the GALL Report recommended further evaluation.

5.3 NRC-Approved Precedents

To help facilitate the staff review of its LRA, the applicant referenced NRC-approved precedents to demonstrate that certain non-GALL AMPs correspond to programs that the staff had approved for other plants during its review of previous applications for license renewal. Using the precedent information, the project team will (1) determine whether the material presented in the precedent is applicable to the applicant's facility; (2) determine whether the applicant's AMP is bounded by the conditions for which the precedent was evaluated and approved; and (3) verify that the applicant's AMP contains the program elements of the referenced precedent. In general, if the project team determines that these conditions are satisfied, it will use the precedent to frame and focus its review of the applicant's AMP.

[3] As noted in Section 2 of this plan, DIPM will review program elements 7, 8, and 9. The results of these reviews will be documented in Section 3 of the plant safety evaluation report.

It is important to note that precedent information is not a part of the license renewal application; it is supplementary information voluntarily provided by the applicant as a reviewers' aid. The existence of a precedent, in and of itself, is not a sufficient basis to accept the applicant's AMP. Rather, the precedent facilitates the review of the substance of the matters described in the applicant's AMP. As such, in the project team's documentation of its reviews of AMPs that are based on precedents, the precedent information is typically implicit in the evaluation, rather than explicit. If the project team determines that a precedent identified by the applicant is not applicable to the particular plant AMP for which it is credited, then the project team reviews the AMP as a plant-specific AMP, without consideration of the precedent information.

5.4 FSAR Supplement Review

Consistent with the SRP-LR, for the AMRs and associated AMPs that it will review, the project team will review the FSAR supplement that summarizes the applicant's programs and activities for managing the effects of aging for the extended period of operation. The project team will also review any commitments associated with its programs and activities made by the applicant and verify that they are acceptable for the stated purpose.

5.5 Documents Reviewed by the Project Team

In performing its work, the project team will rely heavily on the LRA, the audit and review plan, the SRP-LR, and the GALL Report. The project team will also examine the applicant's precedent review documents, its AMP and AMR basis documents (catalogs of the documentation used by the applicant to develop or justify its AMPs and AMRs), and other applicant documents, including selected implementing procedures, to verify that the applicant's activities and programs will adequately manage the effects of aging on structures and components.

5.6 Public Exit Meeting

After it completes its audits and reviews, the project team will hold a public exit meeting to discuss the scope and results of its audits and reviews.

5.7 Documentation Prepared by the Project Team

The project team will prepare an audit and review plan, worksheets, work packages, requests for additional information (RAIs), an audit and review report, and safety evaluation report (SER) input. The project team will also prepare questions during site visits and will track the applicant's responses to the questions.

5.7.1 Audit and Review Plan

The project team leader will prepare a plant-specific audit and review plan as described herein.

5.7.2 Worksheets

Each project team member will informally document the results of his or her work on a variety of worksheets. The worksheets are shown in Appendix E, "Consistent with GALL Report AMP Audit/Review Worksheet" and Appendix G, "Aging Management Review Worksheets." The use of the worksheets is described in Section 6 of this plan.[4]

5.7.3 Questions

As specified in Section 6 of this plan, the project team members will ask the applicant questions during on-site audits, as appropriate, to facilitate its audit and review activities. The team will also track the applicant's answers to the questions.

5.7.4 Work Packages

After each site visit, the project team leader will assemble work packages for any work that the team will refer to the NRR Division of Engineering (DE) for review. Each work package will include a work request and any applicable background information on the review item that was gathered by the project team.

5.7.5 Requests for Additional Information

The review process described in this plan is structured to resolve as many questions as possible during the site visits. As examples, the site visits are used to obtain clarifications about the LRA and explanations as to where certain information may be found in the LRA or its associated documents. Nevertheless, there may be occasions where an RAI is appropriate to obtain information to support an SER finding. The need for RAIs will be determined by the project team leader during the site visits through discussions with the individual project team members. When the project team leader determines that an RAI is needed, the project team member who is responsible for the area of review will prepare the RAI. RAIs will include the technical and regulatory basis for requesting the information.

After the NRC receives a response to an RAI from the applicant, the team leader will provide the response to the team member who prepared the RAI. The team member will review the response and determine if it resolves the issue that was the reason for the RAI. The team member will document the disposition of the RAI in the audit and review report (unless the report was issued before the RAI response was received) and in the SER input. If the audit report was issued before the applicant submitted its response to an RAI, the review of the response will be documented in the SER.

5.7.6 Audit and Review Report

The project team will document the results of its work in an audit and review report. The team will prepare its report as described in Section 6.4.1 of this plan.

[4] Appendix F is reserved for plant-specific AMP audit/review worksheets. There are no plant-specific AMPs assigned to the project team for review.

5.7.7 Safety Evaluation Report Input

The project team leader will prepare SER input, based on the audit and review report, as described in Section 6.4.2 of this plan.

6. Planning, Audit, Review, and Documentation Procedure

This section of the audit and review plan contains the detailed procedures that the project team will follow to plan, perform, and document its work.

6.1 Planning Activities

6.1.1 Schedule for Key Milestones and Activities

The project team leader will establish the schedule for the key milestones and activities, consistent with the overall schedule for making the licensing decision. Key milestones and activities include, as a minimum:

A. receiving the LRA from the applicant
B. receiving work split tables from the project manager
C. making individual work assignments
D. training project team members
E. holding the project team kickoff meeting
F. preparing the audit and review plan
G. scheduling site visits
H. scheduling in-office review periods
I. preparing questions
J. preparing RAIs
K. preparing draft and final audit and review report
L. preparing draft and final SER input

Site visits will be scheduled on the basis of discussions between the project team leader, the NRC license renewal project manager, and the applicant.

Appendix B of this plan contains the target schedule for the key milestones and activities.

6.1.2 Work Assignments

The technical assistance contractor will propose team member work assignments to the NRC project team leader. The NRC project team leader will approve all work assignments. After the audit plan is issued, the team leader may reassign work as necessary.

The contractor will develop assignment tables that show which project team member will review each AMP and AMR. Appendix A of this plan shows the project team membership. Appendix C shows the team member assignments for the AMPs. Appendix D of this plan shows the team member assignments for the AMRs.

6.1.3 Training and Preparation

The training and preparation will include the following:

1. A description of the audit and review process.

2. An overview of audit/review-related documentation and the documentation that the project team will audit and review.

   A. GALL Report
   B. SRP-LR
   C. Interim Staff Guidance (ISG)
   D. LRA AMPs
   E. LRA AMRs
   F. basis documents (catalogues of information assembled by the applicant to demonstrate the bases for its programs and activities)
   G. implementing procedures
   H. operating experience reports
   I. RAIs, audit reports, and SERs for other plants
   J. applicant's FSAR

3. The protocol for interfacing with the applicant.

4. Administrative issues such as travel, control of documentation, work hours, etc.

5. Process for preparing questions, RAIs, the audit and review report, and SER input.

6. Process for interfacing with DE technical reviewers.

6.2 Aging Management Program Audits and Reviews

6.2.1 Types of AMPs

There are two types of AMPs: those that the applicant claims are consistent with AMPs contained in the GALL Report, and those that are plant-specific. The process for auditing and reviewing both types of AMPs is presented in the following sections of this plan.

6.2.2 Scope of AMP Elements to be Audited and Reviewed

Table 1 of this plan shows the 10 program elements that are used to evaluate the adequacy of each aging management program. These program elements are presented in Branch Technical Position (BTP) RLSB-1, "Aging Management Review - Generic," in Appendix A of the SRP-LR, and are summarized in the GALL Report. The project team's scope of review includes 7 of the 10 elements: 1 through 6, and 10.[5]

The program elements audited or reviewed is the same for both AMPs that are consistent with the GALL Report and for plant-specific AMPs.

[5] DIPM will review program elements 7, 8, and 9. The DIPM review will be documented in Section 3 of the plant safety evaluation report.

6.2.3 Plant AMPs That Are Consistent With the GALL Report

Figure 1, "Audit of AMPs That Are Consistent With the GALL Report," is the process flowchart that shows the activities and decisions used by the project team to review and audit each plant AMP that the applicant claims is consistent with the GALL Report.

Preparation

A. For the plant AMP being reviewed, identify the corresponding GALL AMP.

B. Review the associated GALL AMP and identify those elements that will be audited.

C. Identify the documents needed to perform the audit. These may include, but are not limited to, the following:

(1) GALL Report
(2) SRP-LR
(3) ISGs
(4) RAIs and SERs for similar plants
(5) LRA
(6) basis documents
(7) implementation procedures
(8) operating experience reports (plant-specific and industry)
(9) FSAR

Audit/Review

A. Confirm that the seven plant AMP elements are consistent with the corresponding elements of the GALL Report AMP by answering the following questions and then following the process shown in Figure 1.

(1) Did the applicant identify any exceptions to the GALL Report AMP?
(2) Are the elements consistent with the GALL Report AMP?

B. If either of the above questions results in the identification of an exception or a difference to the GALL AMP, determine whether it is acceptable on the basis of an adequate technical justification.

C. If an acceptable basis exists for an exception or difference, document the basis in the worksheet and later in the audit and review report and the SER input.

D. Review the industry and plant-specific operating experience associated with the AMP. This is an area of review emphasis. They require review to identify aging effects requiring management that are not identified by the industry guidance documents (such as Electric Power Research Institute (EPRI) tools) and to confirm the effectiveness of aging management programs. The team members should consider the industry guidance when assessing operating experience and formulating questions for the applicant. The industry guidance (from NEI 95-10, Revision 3) is as follows:

(1) Operating Experience - Aging Effects Requiring Management. A plant-specific operating experience review should assess the operating and maintenance history.

A review of the prior five to 10 years of operating and maintenance history should be sufficient. The results of the review should confirm consistency with documented industry operating experience. Differences with previously documented industry experience such as new aging effects or lack of aging effects allow consideration of plant-specific aging management requirements.

(2) Operating Experience With Aging Management Programs. Plant-specific operating experience with existing programs should be considered. The operating experience of aging management programs, including past corrective actions resulting in program enhancements or additional programs, should be considered. The review should provide objective evidence to support the conclusion that the effects of aging will be managed so that the intended function(s) will be maintained during the extended period of operation. Guidance for reviewing industry operating experience is presented in BTP RLSB-1 in Appendix A.1 of the Branch Technical Positions in SRP-LR.

(3) Industry Operating Experience. Industry operating experience and its applicability should be assessed to determine whether it changes plant-specific determinations. The GALL Report is based upon industry operating experience prior to its date of issue. Operating experience after the issue date of the GALL Report should be evaluated and documented as part of the aging management review. In particular, generic communications such as a bulleting or an information notice should be evaluated for impact upon the AMP. The evaluation should check for new aging effects or a new component or location experiencing an already identified aging effect.

E. If it is necessary to ask the applicant a question to clarify the basis for accepting a program element, or an exception or a difference to the GALL Report AMP, follow the logic process shown in Figure 1.

F. If it is necessary for the applicant to submit additional information to support the basis for accepting a program element, an exception, or a difference, the applicant may agree to voluntarily submit the required information as a supplement to the LRA. If not, the NRC may issue an RAI to obtain the information.

AMP Audit Worksheets

Document the audits/reviews using the worksheet provided in Appendix E, “Consistent with GALL Report AMP Audit/Review Worksheets.”

6.2.4 Plant-Specific AMPs

There are no plant-specific AMPs assigned to the project team.

6.3 AMR Audits and Reviews

There are two types of AMRs: those that the applicant claims are consistent with the GALL Report, and those that are plant-specific. Audit and review of both types of AMRs are discussed below. In general, the project team will review AMRs that are consistent with the GALL Report and AMRs that are based on an NRC-approved precedent that the applicant has identified.

6.3.1 Plant AMRs That Are Consistent With the GALL Report

Figure 3, "Review of AMRs That Are Consistent With the GALL Report," is the process flowchart that shows the activities and decisions used to audit/review each AMR that the applicant claims is consistent with the GALL Report.

Preparation

A. For the plant AMRs that the applicant claims are consistent with the GALL Report, identify the corresponding AMRs in Volume 2 of the GALL Report.

B. Review the associated GALL Report AMRs and identify those line items that will be audited/reviewed in conjunction with each of the plant AMRs.

C. Identify the documents needed to perform the review. These may include, but are not limited to, the following:

(1) GALL Report
(2) SRP-LR
(3) ISGs
(4) RAIs and SERs for similar plants
(5) LRA
(6) basis documents
(7) implementation procedures
(8) operating experience reports (plant-specific and industry)
(9) FSAR

Audit/Review

A. Each AMR line item is coded with a letter which represents a standard note designation.[6] The letter notes are described in Table 2 of this plan. Notes that use numeric designators are plant-specific. The note codes A though E are classified as "consistent with the GALL Report," and will be reviewed in accordance with the guidance contained in this plan.

B. The AMR review involves verification that the applicant has satisfied the requirements of 10 CFR 54.21(a)(3). This requirement states that, for "each structure and component [within the scope of license renewal], demonstrate that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the extended period of operation."

C. Verify compliance by following the process shown in Figure 3. The process is summarized below:

[6] The AMR line item letter notes are based on a letter from A. Nelson, NEI, to P. T. Kuo, NRC, "U.S. Nuclear Industry's Proposed Standard License Renewal Application Format Package, Request NRC Concurrence," dated January 24, 2003 (ML030290201). The staff concurred in the format of the standardized format for LRAs by letter dated April 7, 2003, from P.T. Kuo, NRC, to A. Nelson, NEI (ML030990052).

(1) For each AMR line item, perform the review associated with the letter note (A through E) assigned to the AMR line item. Specifically, determine if the AMR is consistent with the GALL Report for the elements associated with its note.
(2) If Note A applies, and the applicant uses a plant-specific AMP[7], determine if the component is within the scope of the cited plant AMP. If the component is within the scope of the plant AMP, the AMR line item is acceptable. If not acceptable, go to Step (7) below.
(3) If Note B applies, review the LRA exceptions and document the basis for acceptance in the worksheet, and later in the audit and review report. If not acceptable, go to Step (7) below.
(4) If Note C or D applies, determine if the component type is acceptable for the material, environment, and aging effect. If Note D applies, also review the LRA exceptions and document the basis for acceptance in the worksheet, and later in the audit and review report. If not acceptable, go to Step (7) below.
(5) If Note E applies, review the AMP audit report findings to determine if the scope of the alternate AMP envelopes the AMR line item being reviewed and satisfies 10 CFR 54.21(a)(3). If it does not, go to Step (7) below.
(6) Review the corresponding LRA Table 3.X.1 entry that is referenced in LRA Table 3.X.2.Y. If applicable, determine whether the applicant's "Further Evaluation Recommended" response in LRA Section 3.X.2.2.Z is enveloped by Section 3.X.2.2.Z of the SRP-LR. If not, go to Step (7) below. If the LRA section does not meet the acceptance criteria of Appendix A of the SRP-LR, go to Step (7) below.
(7) If during the review a difference is identified, prepare a question to the applicant, in order to obtain clarification.

    (a) Review the applicant's response to the question. If it appears acceptable, re-start the audit/review for the AMR line item from Step (1) above.
    (b) If the applicant's response does not resolve the question or issue, prepare an additional question to obtain the information needed to achieve resolution. Review the applicant's response to the second question. If it appears acceptable, re-start the audit/review for the AMR line item from Step (1) above.
    (c) If it is necessary for the applicant to submit additional information to resolve a question or an issue or to support a basis or conclusion, the applicant may submit the information as a supplement to the LRA or the NRC may issue an RAI to obtain the information. The team leader should be consulted if docketed information may be needed.

AMR Audit/Review Worksheets

Document the audits/reviews of plant AMRs using the worksheet provided in Appendix G, "Aging Management Review Worksheets."

[7] Some GALL AMRs reference the use of a plant-specific AMP. In such cases the AMR audit requires the project team member to confirm that the plant-specific AMP is appropriate to manage the aging effects during the period of extended operation.

6.3.2 AMRs Based on NRC-Approved Precedents

Figure 4, "AMR Review Using NRC-Approved Precedent," is the process flowchart that shows the activities and decisions used to review plant AMRs that the applicant has identified as being consistent with an NRC-approved precedent.[8]

Preparation

Identify the documents needed to perform the audit/review. These may include, but are not limited to, the following:

(1) GALL Report
(2) SRP-LR
(3) ISGs
(4) RAIs and SERs for similar plants
(5) LRA
(6) basis documents
(7) implementation procedures
(8) operating experience reports (plant-specific and industry)
(9) FSAR

Audit/Review

A. The AMR audit/review involves verification that the requirements of 10 CFR 54.21(a)(3) are satisfied. This criterion states that, "For each structure and component [within the scope of license renewal], demonstrate that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the CLB for the period of extended operation."

B. For AMRs with an NRC-approved precedent, this may be achieved by answering the following questions while following the assessment process shown in Figure 4.

   (1) Is the precedent appropriate for the LRA AMR being reviewed?
   (2) Is the NRC-approved precedent sufficiently documented or understood to technically support the adequacy of the LRA AMR being reviewed?
   (3) Is the LRA AMR within the bounds of the chosen NRC-approved precedent?
   (4) If any of these questions results in a 'No' answer, then additional information is required to make a determination that the AMR is acceptable.
   (5) If it is necessary to ask the applicant a question to obtain clarification on the basis for accepting the AMR, the process shown in Figure 4 should be used.
   (6) If it is necessary for the applicant's response to be docketed as a basis for accepting the exception or difference, the applicant may voluntarily docket the response or the NRC may issue an RAI.

[8] Applicant identified NRC-approved precedents are only to be used as an aid for performing AMR audits. The audit conclusions will be based on the technical basis of the AMR and its applicability to the plant being reviewed. It is not acceptable to simply cite the NRC-approved precedent as its basis.

AMR Audit/Review Worksheets

Document the audits/reviews using the worksheet provided in Appendix G, "Aging Management Review Worksheets."

6.4 Audit and Safety Review Documentation

As noted in Section 5.7 of this plan, the project team will prepare an audit and review plan, worksheets, work packages, requests for additional information, an audit and review report, and a SER input. This section of the plan addresses the preparation of the audit and review report and the SER input.

6.4.1 Audit and Review Report

1. Format and content of the audit and review report. The report should include the following:

   A. Cover page
   B. Table of Contents
   C. Section 1, Introduction and General Information
   D. Section 2, Aging Management Programs Audit and Review Results
   E. Section 3, Aging Management Review Audit and Review Results
   F. Section 4, Time-Limited Aging Analyses
   G. Attachment 1, Abbreviations and Acronyms
   H. Attachment 2, Project Team and Applicant Personnel
   I. Attachment 3, Elements of an Aging Management Program for License Renewal
   J. Attachment 4, Disposition of Requests for Additional Information, LRA Supplements and Open Items
   K. Attachment 5, List of Documents Reviewed
   L. Attachment 6, List of Commitments

2. The following paragraphs describe, in general, the type of information and the level of detail necessary for each report section.

   A. Cover page that identifies the following:

      (1) Name of the plant and units
      (2) Docket number of the plants
      (3) Organization preparing the report
      (4) Contract number under which the work was performed
      (5) Acknowledgement that the report was prepared for the License Renewal and Environmental Impacts Program, Division of Regulatory Improvement Programs, Office of Nuclear Reactor Regulation
      (6) Date of the report

   B. Table of Contents.

   C. Section 1, Introduction and General Information. The introduction and general information should include the following information.

(1) Section 1.1, Introduction. This section of the report should provide an overview of the audit and review conducted by the project team. It should also list key audit and review activities, including on-site visits, as well as the organizations supporting the audit and review. This information should be taken largely from the audit and review plan.

(2) Section 1.2, Background. This section of the report should include a summary of the license renewal requirements as stated in the Code of Federal Regulations and a summary of the documents that the project team used to carry out the audit and review. This information should be taken largely from the audit and review plan.

(3) Section 1.3, Summary of Information in the License Renewal Application. This section of the report should include a description of the information contained in the license renewal application that is applicable to the audit and review. This information should be taken largely from the audit and review plan.

(4) Section 1.4, Audit and Review Scope. This section of the report should indicate that the AMRs and associated AMPs that the project team reviewed are identified in the audit and review plan. It should also include a general statement of the types and numbers of AMRs and AMPs that the team audited and reviewed.

(5) Section 1.5, Audit and Review Process. This section of the report should state that the audit and review was performed in accordance with the processes defined in the audit and review plan and should summarize the audit and review process for AMPs, AMRs, and the Final Safety Analysis Report (FSAR) supplement. This section of the report should include the following subsections:

i. 1.5.1 PNP AMPs
ii. 1.5.2 PNP AMR Results
iii. 1.5.3 NRC-Approved Precedents
iv. 1.5.4 Final Safety Analysis Report Supplement
v. 1.5.5 Documentation and Documents Reviewed
vi. 1.5.6 Commitments to be included in the Safety Evaluation Report

(6) Section 1.6, Exit Meeting. This section should include an acknowledgement of and a brief summary of the public exit meeting.

D. Section 2, Aging Management Programs Audit and Review Results.

NOTE: This section of the report contains the project team's review results and evaluation of the aging management programs. Numbering of these AMP writeups should be sequential based on the order presented in the applicant's LRA (e.g., the section number for first plant AMP should be 2.1). Depending on the plant AMP, whether it is consistent with the Generic Aging Lessons Learned (GALL) Report or plant-specific, (1) or (2), respectively, as provided below, is to be used.

(1) For AMPs that are consistent with the GALL Report.

The project team's audit and review of each AMP that the applicant identified as consistent with the GALL Report should be documented in the report. Each AMP

should have an individual subsection in the report, identified in the table of contents, that includes the following:

i. A subsection (e.g., 2.X, AMP NAME (AMP Number) that identifies the plant AMP name and number and the section of the LRA (number and title) that includes the AMP.

ii. A subsection (e.g., 2.X.1, Program Description) that describes the plant AMP.

iii. A subsection (e.g., 2.X.2, Consistency with the GALL Report) that describes the plant AMP consistency with respect to the GALL AMP. The inputs to this determination, including the key documents reviewed and the applicant staff interviewed are to be documented here, followed by an evaluation and basis for concluding that the plant AMP is (or is not) consistent with the GALL AMP.

   If exceptions or enhancements were identified by the applicant, state so. If any differences were identified by the project team, describe them here. If the applicant chooses to treat the identified difference as an exception, evaluate it in Section 2.X.3 and refer to that discussion here. If the applicant chooses to address the difference as a required enhancement, evaluate it in Section 2.X.4 and refer to that discussion here. If the applicant addressed the difference with a formal response to an RAI or a supplement to the LRA, document the submittal (include the date and the ADAMS accession number), summarize the applicant's position, identify the basis for resolution or rejection of the difference, and document it here.

   For any unresolved items, the NRC staff should issue a request for additional information (RAI). If the applicant responds to the RAI prior to the issuance of the audit report, the project team should document the response (include the dated and the ADAMS accession number), summarize the applicant's position, explain the issue that the response resolved, and discuss the basis for the resolution. Otherwise, the project team should document the issue and the associated RAI number, and indicate that the review of the RAI response will be documented in the safety evaluation report.

iv. A subsection (e.g., 2.X.3, Exceptions to the GALL Report) that lists any exceptions to the GALL AMP, a restatement of the GALL AMP program element criteria that apply to the exception, and an evaluation that clearly explains why any exceptions (identified by either the applicant or the project team) to the GALL AMP are acceptable.

   The evaluation should address any supplements to the LRA. If the applicant submitted a supplement to its LRA to resolve a question or issue, document the submittal (include the date and the ADAMS accession number), summarize the applicant's position, explain the issue that the submittal resolved, and discuss the basis for the resolution.

   For any unresolved items, the NRC staff should issue a request for additional information (RAI). If the applicant responds to the RAI prior to the issuance of the audit report, the project team should document the response (include the dated and the ADAMS accession number), summarize the applicant's

position, explain the issue that the response resolved, and discuss the basis for the resolution. Otherwise, the project team should document the issue and the associated RAI number, and indicate that the review of the RAI response will be documented in the safety evaluation report.

If there are no exceptions, enter None.

v. A subsection (e.g., 2.X.4, Enhancements) that lists any enhancements to the applicant's AMP to meet the GALL Report, a restatement of the GALL AMP program element criteria that apply to the enhancement, and an evaluation that clearly explains why any enhancements to the applicant's AMP are acceptable and that such changes to the applicant's program will provide additional assurance that the effects of aging will be adequately managed.

The evaluation should address any supplements to the LRA. If the applicant submitted a supplement to its LRA to resolve a question or issue, document the submittal (include the date and the ADAMS accession number), summarize the applicant's position, explain the issue that the submittal resolved, and discuss the basis for the resolution.

For any unresolved items, the NRC staff should issue a request for additional information (RAI). If the applicant responds to the RAI prior to the issuance of the audit and review report, the project team should document the response (include the dated and the ADAMS accession number), summarize the applicant's position, explain the issue that the response resolved, and discuss the basis for the resolution. Otherwise, the project team should document the issue and the associated RAI number, and indicate that the review of the RAI response will be documented in the safety evaluation report.

If there are no enhancements, enter None.

vi. A subsection (e.g., 2.X.5, Operating Experience) that documents the project team's review of the plant-specific and industry operating experience associated with the plant AMP.

vii. A subsection (e.g., 2.X.6, FSAR Supplement) that documents the project team's review of the adequacy of the applicant's commitment to revise the FSAR.

viii. A subsection (e.g., 2.X.7, Conclusions) that documents the project team's conclusions regarding the AMP. The conclusion should discuss the AMP consistency with the GALL AMP, the disposition status of any exceptions or enhancements, and state if the criteria of 10 CFR54.21(a)(3) will be satisfied.

Also, the conclusion should discuss the adequacy of the AMP and whether the criteria of 10 CFR54.21(d) will be satisfied.

(2) For AMPs that are Plant-Specific

There are no plant-specific AMPs assigned to the project team.

E. Section 3, Aging Management Review Audit and Review Results

This section of the report contains the project team's review results and evaluation of the aging management reviews.

(1) A summary of the documents that the project team reviewed to perform the audit and review, e.g., the LRA, the SRP-LR, and the applicant's basis documents.

(2) A summary review of the AMR notes used by the applicant to classify the AMR line-items used in the LRA Tables 3.X.2 Y if they are relevant to the audit and review (Notes A through E for AMR's that are consistent with the GALL Report; Notes A through J if the review is based on an NRC-approved precedent).

(3) The basis for accepting any exceptions to the GALL Report AMRs that were identified by the applicant or the project team reviewer.

(4) Information about any supplements submitted by the applicant. The evaluation should address any LRA supplements that the applicant submitted to resolve questions or issues. Document the submittal (include the date and the ADAMS accession number), summarize the applicant's position, explain the issue that the submittal resolved, and discuss the basis for the resolution.

(5) Information about any RAIs. For any unresolved items, the NRC staff should issue a request for additional information (RAI). If the applicant responds to the RAI prior to the issuance of the audit report, the project team should document the response (include the dated and the ADAMS accession number), summarize the applicant's position, explain the issue that the response resolved, and discuss the basis for the resolution. Otherwise, the project team should document the issue and the associated RAI number, and indicate that the review of the RAI response will be documented in the safety evaluation report.

NOTE: For each of the applicant's LRA AMRs Sections, (i.e, Sections 3.1 through 3.6), a writeup is required for each section and is described below. Numbering of these AMRs writeup should be sequential based on the order presented in the applicant's LRA (e.g., the section number for first section should be 3.1). Also, the title of the sections should be the same as the title of the applicant's LRA for that section (i.e., the Aging Management of Reactor Vessel, Internals, and Reactor Coolant System).

(6) 3.X Applicant's LRA Section 3.X - Aging Management of

This section includes introductory information for the LRA Section 3.X and should contain the LRA section that the project team reviewed and a summary of the type of information provided in the section of the LRA reviewed, including a listing of component types associated with this LRA section. A discussion on the component type of AMRs reviewed (i.e., those components where further evaluation is recommended, those for which no further evaluation is required, and those that are not applicable together with the basis for their exclusion). Also, identify the SRP-LR Section for which the review is performed against.

i. (3.X.1) Aging Management Review Results That Are Consistent With the GALL Report

This section of the audit and review report documents reviews of AMRs that are consistent with the GALL Report. It should include the following.

(a) A introductory paragraph that states the project team's determination of the applicant's reference to the GALL Report is acceptable.

(b) A paragraph that identifies what the project team reviewed.

(c) Document information on AMRs consistent with the GALL Report for which no further information is required only if there was an audit finding that resulted in an RAI or an open item requiring a formal response from the applicant. Numbering of the subsection should be sequential based on the order presented in the applicant's LRA (i.e., 3.X.1.1). The title of the subsection should be based on the subject of discussion. If there was no finding, skip the next three items and go to item (f).

(d) Information about any supplements submitted by the applicant. The evaluation should address any LRA supplements that the applicant submitted to resolve questions or issues. Document the submittal (include the date and the ADAMS accession number), summarize the applicant's position, explain the issue that the submittal resolved, and discuss the basis for the resolution.

(e) Information about any RAIs. For any unresolved items, the NRC staff should issue a request for additional information (RAI). If the applicant responds to the RAI prior to the issuance of the audit report, the project team should document the response (include the dated and the ADAMS accession number), summarize the applicant's position, explain the issue that the response resolved, and discuss the basis for the resolution. Otherwise, the project team should document the issue and the associated RAI number, and indicate that the review of the RAI response will be documented in the safety evaluation report.

(f) An evaluation determining that:
1. The applicant identified the applicable aging effects.
2. The applicant defined the appropriate combination of materials and environments.
3. The applicant specified acceptable AMPs.
4. A conclusion stating that, if appropriate, the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained for the period of extended operation, and that 10 CFR 54.21(a)(3) has been satisfied.

(g) A conclusion that documents the project team's overall conclusions regarding AMRs not requiring further evaluation. Specifically, the applicant's references to the GALL Report are acceptable and that no further project team review is required.

ii. (3.X.2) Aging Management Review Results For Which Further Evaluation Is Recommended By The GALL Report

This section of the audit and review report documents reviews of AMR results for which the GALL Report recommends further evaluation. It should include the following:

(a) An introductory paragraph that states the project team's determination of the applicant's reference to the GALL Report which require further evaluation. A summary of the type of information provided in the section of the LRA reviewed. Identify the LRA Tables 3.X.2.-Y through 3.X.2-Z listed in this section. Also, identify the SRP-LR Section for which the review is performed against.

(b) A subsection for each of the LRA sections (3.X.2.2.Y) containing the applicant's further evaluations of AMRs for which further evaluation is recommended.

(c) For each LRA Section 3.X.2.2.Y containing the applicant's further evaluations, the following should be included:
1. A statement that the project team audited the applicant's further evaluations against the criteria contained in Section 3.X.2.2.Y of the SRP-LR.
2. The SRP-LR Section 3.X.2.2.Y criteria.
3. The basis for concluding that it the applicant's evaluation of the aging effect satisfies the criteria contained in Section 3.X.2.2.Y of the SRP-LR.
4. Information about any supplements submitted by the applicant. The evaluation should address any LRA supplements that the applicant submitted to resolve questions or issues. Document the submittal (include the date and the ADAMS accession number), summarize the applicant's position, explain the issue that the submittal resolved, and discuss the basis for the resolution.

(d) Information about any RAIs. For any unresolved items, the NRC staff should issue a request for additional information (RAI). If the applicant responds to the RAI prior to the issuance of the audit report, the project team should document the response (include the dated and the ADAMS accession number), summarize the applicant's position, explain the issue that the response resolved, and discuss the basis for the resolution. Otherwise, the project team should document the issue and the associated RAI number, and indicate that the review of the RAI response will be documented in the safety evaluation report.

(e) A concluding paragraph summarizing the project team evaluation of the particular aging effect.

iii. (3.X.3) Aging Management Review Results That Are Not Consistent With GALL Report Or Are Not Addressed in the GALL Report

This section of the audit and review report documents reviews of AMRs that are not consistent with the GALL Report or are not addressed in the GALL Report and should include the following:

(a) An introductory paragraph that states the project team's review of AMR results that are not consistent with the GALL Report or are not addressed in the GALL Report. A summary of the type of information provided in the section of the LRA reviewed. Identify the LRA Tables 3.X.2.-Y through 3.X.2-Z listed in this section.

(b) For each LRA Table 3.X.2-Y in LRA Section 3.X, the results and findings of previously approved positions of the NRC staff that were reviewed.

(c) An evaluation and finding that determines that:
1. the applicant identified the applicable aging effect and component,
2. the applicant listed the appropriate combination of materials and environments, and
3. the applicant identified acceptable AMPs.

(d) Information about any supplements submitted by the applicant. The evaluation should address any LRA supplements that the applicant submitted to resolve questions or issues. Document the submittal (include the date and the ADAMS accession number), summarize the applicant's position, explain the issue that the submittal resolved, and discuss the basis for the resolution.

(e) For additional information (RAI). If the applicant responds to the RAI prior to the issuance of the audit report, the project team should document the response (include the dated and the ADAMS accession number), summarize the applicant's position, explain the issue that the response resolved, and discuss the basis for the resolution. Otherwise, the project team should document the issue and the associated RAI number, and indicate that the review of the RAI response will be documented in the safety evaluation report.

(f) A conclusion stating, if appropriate, that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained during the period of extended operation, and 10 CFR 54.21(a)(3) has been satisfied.

F. Section 4, Time-Limited Aging Analyses

This section documents the project team review of the applicant's TLAA.

Reviewer to add TLAA discussion in this section. For guidance on developing this section, confer with some of the more recent SERs.

G. Attachment 1, Abbreviations and Acronyms. This attachment should identify the abbreviations and acronyms used in the audit and review report.

H. Attachment 2, Project Team and Applicant Personnel. This attachment should identify the project team members, the project team support personnel, the key applicant personnel who were consulted during the audit and review, and the individuals that attended the exit meeting.

I. Attachment 3, Elements of an Aging Management Program for License Renewal. This attachment is a standard table of the 10 program elements that are used to evaluate the adequacy of each AMP as presented in Branch Technical Position (BTP) RLSB 1, "Aging Management Review - Generic," in Appendix A of the SRP-LR.

J. Attachment 4, Disposition of Requests for Additional Information, LRA Supplements, and Open Items. This attachment should identify the following.

   (1) A list of the formal RAIs that were issued as a result of the audit/review and a summary of the disposition of the applicant's responses to each RAI.

   (2) A list of issues that the applicant agreed to formally address through a supplement to its LRA and a summary of the disposition of each issue.

   (3) The applicable AMP or AMR for each RAI and LRA supplement.

   (4) Possible dispositions which could include open, closed, or confirmatory items. The initiation of each RAI and LRA supplement, as well as its dispositions, should be clearly documented in conjunction with the audit and review results in the applicable AMP or AMR sections of the report.

K. Attachment 5, List of Documents Reviewed. This attachment should list all of the documents reviewed by the project team to support its AMP and AMR audits and reviews and to support its evaluations and conclusions.

   (1) Indicate which documents were reviewed for each AMP or AMR section.

   (2) Include both docketed documents (e.g., the license renewal application) and non-docketed documents (e.g., basis documents, condition reports, and implementing procedures).

   (3) Include both licensee-controlled documents (e.g., basis documents, condition reports, and implementing procedures) and other documents (e.g., topical reports and industry codes and standards).

L. Attachment 6, List of Commitments. This attachment should list and summarize all commitments made by the applicant that were reviewed by the project team, including any commitments that the applicant made in response to the project team's audit and review. This information can be subsequently excerpted for the safety evaluation report (SER).

6.4.2 Safety Evaluation Report Input

1. General guidance

   A. Prepare the SER input for the AMP and AMR audits and reviews.

   B. In general, the data and information needed to prepare the SER input should be available in the project team's audit and review report and the team member's worksheets.

   C. SER inputs are to be prepared for:

      (1) Each AMP that was determined to be consistent with the GALL Report, which has no exceptions or enhancements.
      (2) Each AMP that was determined to be consistent with the GALL Report, which has exceptions (identified by either the applicant or the project team) or enhancements.
      (3) Each plant-specific AMP.
      (4) AMRs that are consistent with the GALL Report.
      (5) Project team AMR review results[9].

   D. The SER input should contain the following sections. (Note: The following section numbers (3. through 3.X.3) are based on the numbering system for the SER input. They are not a continuation of the numbering convention used throughout this plan.)

      3. Aging Management Review Results
         3.0 Applicant's Use of the Generic Aging Lessons Learned Report
         3.0.1 Format of the LRA
         3.0.2 Staff's Review Process
            3.0.2.1 Review of AMPs
            3.0.2.2 AMRs in the GALL Report
            3.0.2.3 NRC-Approved Precedents
            3.0.2.4 FSAR Supplement
            3.0.2.5 Documentation and Documents Reviewed
         3.0.3 Aging Management Programs
            3.0.3.1 AMPs that are Consistent With the GALL Report
            3.0.3.2 AMPs that are Consistent With GALL Report With Exceptions or Enhancements
            3.0.3.3 AMPs that are Plant-Specific
         3.0.4 Quality Assurance Program Attributes Integral to Aging Management Programs
         3.X[10] Aging Management of _____
         3.X.1 Summary of Technical Information in the Application
         3.X.2 Staff Evaluation

[9] AMRs that are not consistent with the GALL Report.
[10] The LRA AMR results are broken down into six sections and address the following system/structure groups: (1) Section 3.1, reactor vessel, internals and reactor coolant system, (2) Section 3.2, engineering safety features systems, (3) Section 3.3, auxiliary systems, (4) Section 3.4, steam power and conversion systems, (5) Section 3.5, structures and component supports, (6) Section 3.6, electrical and instrumentation and controls.

3.X.2.1 Aging Management Evaluations that are Consistent with the GALL Report, for Which Further Evaluation is Not Required
3.X.2.2 Aging Management Evaluations that are Consistent with the GALL Report, for Which Further Evaluation is Recommended
3.X.2.3 AMR Results that are Not Consistent with or Not Addressed in the GALL Report
3.X.3 Conclusion

E. For each AMP audited/reviewed by the project team, the SER shall include a discussion of the team's review of the operating experience program element.

F. If the applicant submitted an amendment or a supplement to its LRA that is associated with the project team's audit or review activities, document the submittal (include the date and ADAMS accession number) and explain the issue that the submittal resolved and discuss the basis for the resolution.

G. If an RAI was issued, identify the RAI number and briefly discuss the RAI. State if the RAI remains open or if the applicant response has been received and accepted. If the response was acceptable, identify the submittal (including the date and the ADAMS accession number) that provided the response and document the basis for its acceptance.

H. Issues (e.g., RAIs) that have not been resolved by the applicant at the time the SER input is prepared should be identified as open items.

2. SER input

A. For AMPs determined to be consistent with the GALL Report, without exceptions, include the AMP title, the plant AMP paragraph number, and a discussion of the basis for concluding that the FSAR supplement (Appendix A of the LRA) is acceptable. This SER input documents that the AMP is consistent with the GALL Report.

B. For AMPs determined to be consistent with the GALL Report, with exceptions or enhancements, the SER input should include a statement that the audit found the AMP consistent with the GALL Report and that any applicant-identified exceptions to the GALL Report were found technically acceptable to manage the aging effect during the period of extended operation. The SER input should identify the exceptions and provide the basis for acceptance. The SER input will also address the FSAR supplement, and document the basis for concluding that it is acceptable.

C. For plant-specific AMPs, the SER input should document the basis for accepting each of the seven elements reviewed by the project team. The SER input should also include a discussion concerning the adequacy of the FSAR supplement.

D. For aging management evaluations that are consistent with the GALL Report,[11] the SER input should include the following:

[11] The audit results documented in this section address the AMRs consistent with the GALL Report for which no further evaluation is recommended.

(1) Identify the LRA section reviewed.
(2) A summary of the type of information provided in the section of the LRA reviewed, including a listing of the AMPs reviewed.
(3) Identify the LRA Tables 3.X.2-Y reviewed.
(4) A summary review of the AMR Notes A through E used to classify the AMR line items used in these tables.
(5) A brief summary of what the staff (project team) reviewed to perform the audit, i.e., LRA and applicant basis documents and other implementation documents. Reference the appendix that lists the details of the documents reviewed.
(6) The bases for accepting any exceptions to GALL AMRs that were identified by the applicant or the project team member.
(7) A finding that verifies that:
   i. The applicant identified the applicable aging effects.
   ii. The applicant defined the appropriate combination of materials and environments.
   iii. The applicant specified acceptable AMPs.
(8) A conclusion stating, if applicable, that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, and that 10 CFR 54.21(a)(3) has been satisfied.

E. For aging management evaluations that are consistent with the GALL Report, for which further evaluation is recommended, the SER input should include the following:

(1) The LRA section containing the applicant's further evaluations of AMRs for which further evaluation is required.
(2) A list of the aging effects for which the further evaluation apply.
(3) For the applicant's further evaluations, provide a summary of the basis for concluding that it satisfied the criteria of Section 3.1.3.2 of the SRP-LR.
(4) A statement that the staff audited the applicant's further evaluations against the criteria contained in Section 3.1.3.2 of the SRP-LR.
(5) A statement that the audit and review report contains additional information. Also identify the issue date and the ADAMS accession number for the audit and review report.

F. Staff AMR Review Results.[12] This section of the SER input documents the reviews of AMRs assigned to the project team that are not consistent with the GALL Report. The audit report should document the following, based on a precedent identified by the applicant:

(1) The LRA section reviewed.
(2) A summary of the type of information provided in the section of the LRA, reviewed, including a listing of the AMPs reviewed for this LRA section.
(3) Identify the LRA Tables 3.X.2-Y documented by this audit writeup.
(4) A brief summary of what the staff (project team) reviewed, i.e., LRA and applicant basis documents and other implementation documents.
(5) A finding that verifies, if true, that:

[12] This section documents reviews of AMRs assigned to the project team that are not consistent with the GALL Report.

i. The applicant identified the applicable aging effects.
ii. The applicant listed the appropriate combination of materials and environments.
iii. The applicant specified acceptable AMPs.

(6) Provide a conclusion stating, if applicable, that the applicant has demonstrated that the effects of aging will be adequately managed so that the intended functions will be maintained consistent with the CLB for the period of extended operation, and that 10 CFR 54.21(a)(3) has been satisfied.

6.5 Documents Reviewed and Document Retention

Any documents reviewed that were used to formulate the basis for resolution of an issue, such as the basis for a technical resolution, the basis for the acceptance of an exception or an enhancement, etc., should be documented as a reference in the audit and review report.

Upon issuance of the audit and review report, all worksheets that were completed by contractor and NRC personnel shall be given to the NRC project team leader.

After the NRC has made its licensing decision, all copies of documents collected and all documents generated to complete the audit and review report, such as audit worksheets, question and answer tracking documentation, etc., are to be discarded.

Table 1. Aging Management Program Element Descriptions

Element		Description
1	Scope of the program	The scope of the program should include the specific structures and components subject to an aging management review.
2	Preventive actions	Preventive actions should mitigate or prevent the applicable aging effects.
3	Parameters monitored or inspected	Parameters monitored or inspected should be linked to the effects of aging on the intended functions of the particular structure and component.
4	Detection of aging effects	Detection of aging effects should occur before there is loss of any structure and component intended function. This includes aspects such as method or technique (i.e., visual, volumetric, surface inspection), frequency, sample size, data collection and timing of new/one-time inspections to ensure timely detection of aging effects.
5	Monitoring and trending	Monitoring and trending should provide prediction of the extent of the effects of aging and timely corrective or mitigative actions.
6	Acceptance criteria	Acceptance criteria, against which the need for corrective action will be evaluated, should ensure that the particular structure and component intended functions are maintained under all current licensing basis design conditions during the period of extended operation.
7	Corrective actions	Corrective actions, including root cause determination and prevention of recurrence, should be timely.
8	Confirmation process	The confirmation process should ensure that preventive actions are adequate and appropriate corrective actions have been completed and are effective.
9	Administrative controls	Administrative controls should provide a formal review and approval process.
10	Operating experience	Operating experience involving the aging management program, including past corrective actions resulting in program enhancements or additional programs, should provide objective evidence to support a determination that the effects of aging will be adequately managed so that the structure and component intended functions will be maintained during the period of extended operation.

Table 2. Notes for License Renewal Application Tables 3.X.2-Y[13]

Note	Description
A	Consistent with the GALL Report item for component, material, environment, and aging effect. AMP is consistent with the GALL Report AMP.
B	Consistent with the GALL Report item for component, material, environment, and aging effect. AMP takes some exceptions to the GALL Report AMP.
C	Component is different, but consistent with the GALL Report item for material, environment, and aging effect. AMP is consistent with the GALL Report AMP.
D	Component is different, but consistent with the GALL Report item for material, environment, and aging effect. AMP takes some exceptions to the GALL Report AMP.
E	Consistent with the GALL Report for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in the GALL Report for this component.
G	Environment not in the GALL Report for this component and material.
H	Aging effect not in the GALL Report for this component, material and environment combination.
I	Aging effect in the GALL Report for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in the GALL Report.

[13] Each AMR line item is coded with a letter which represents a standard note designation based on a letter from A. Nelson, NEI, to P.T. Kuo, NRC, "U.S. Nuclear Industry's Proposed Standard License Renewal Application Format Package, Request NRC Concurrence," dated January 24, 2003 (ML030290201). The staff concurred in the format of the standardized format for license renewal applications by letter dated April 7, 2003, from P.T. Kuo, NRC, to A. Nelson, NEI (ML030990052).

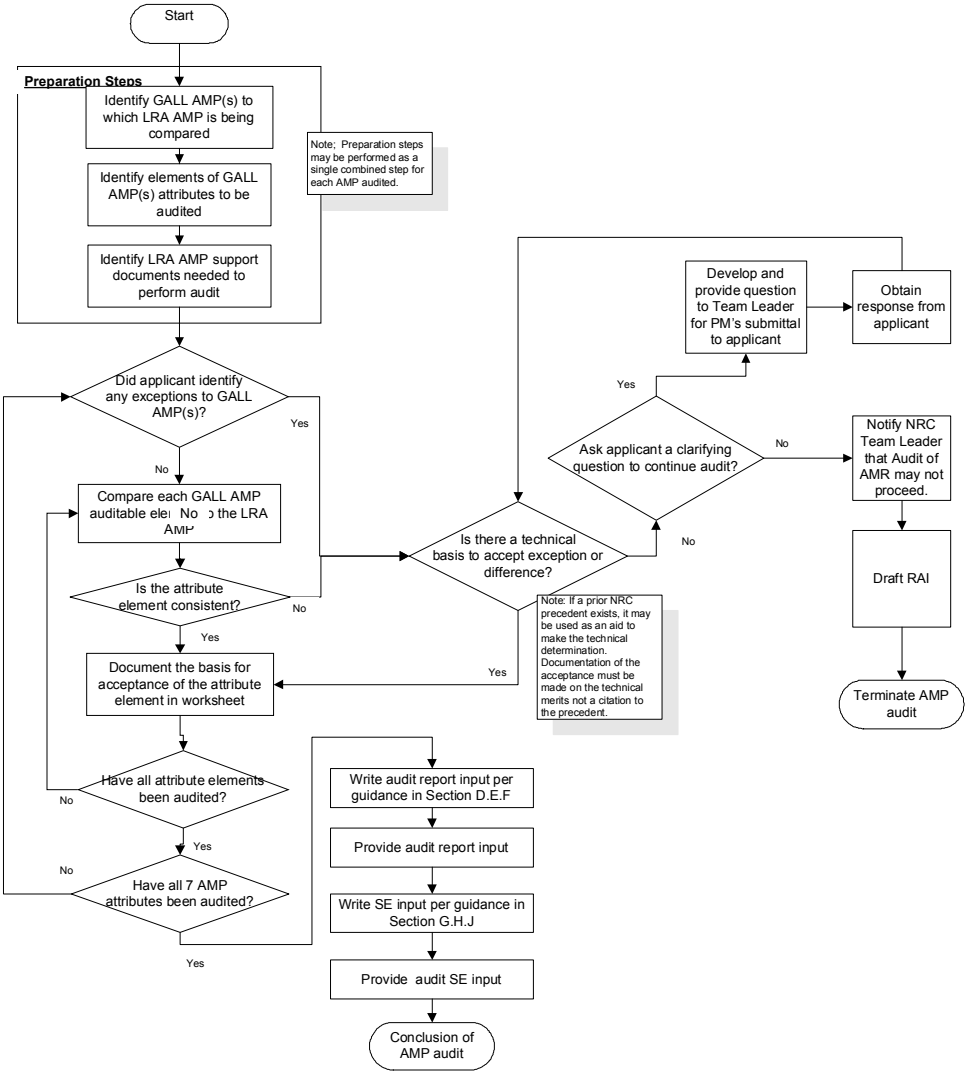

Figure 1. Audit of AMPs That Are Consistent With the GALL Report

Figure has been deleted

(Note: There are no plant-specific AMPs to be reviewed by the project team.)

Figure 2. Audit of Plant-Specific AMPs

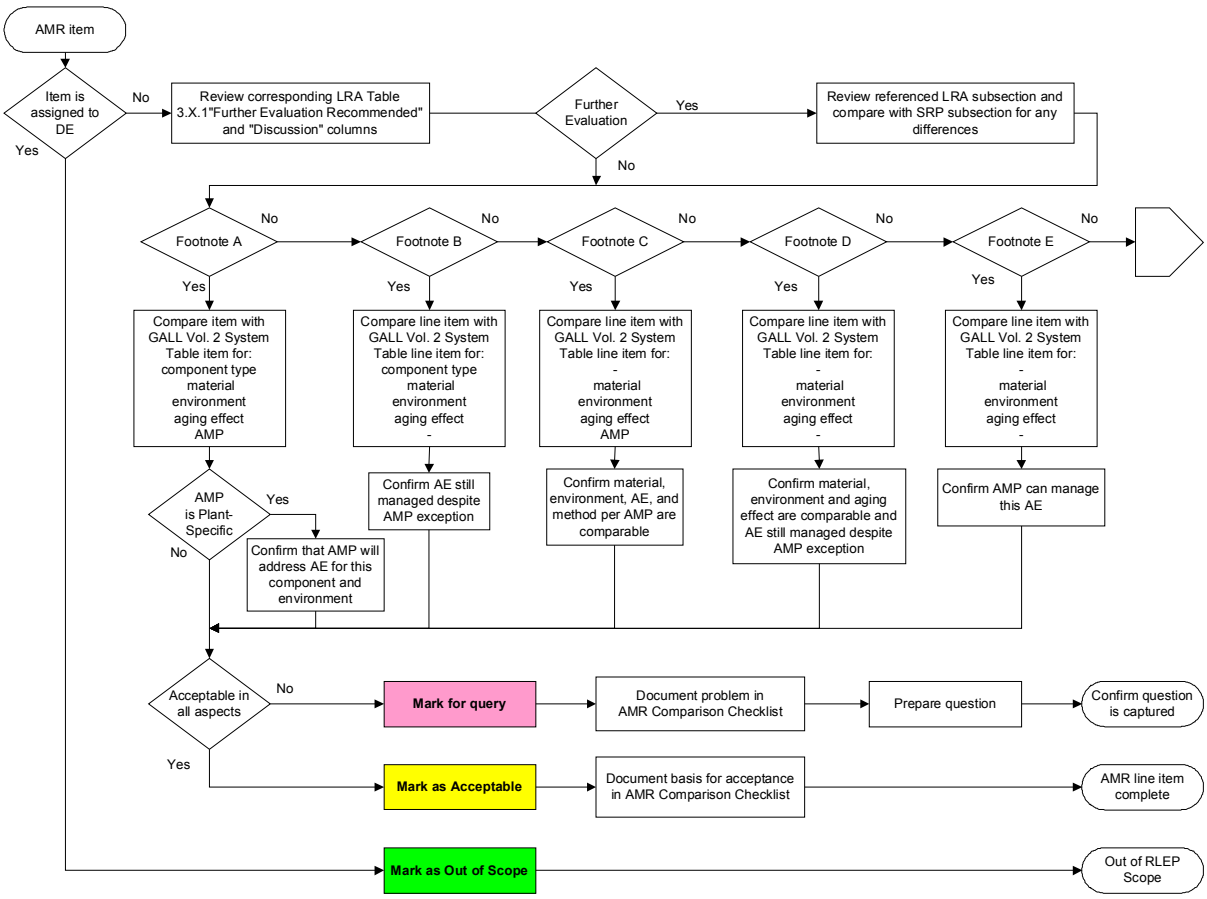

Figure 3. Review of AMRs That Are Consistent With the GALL Report

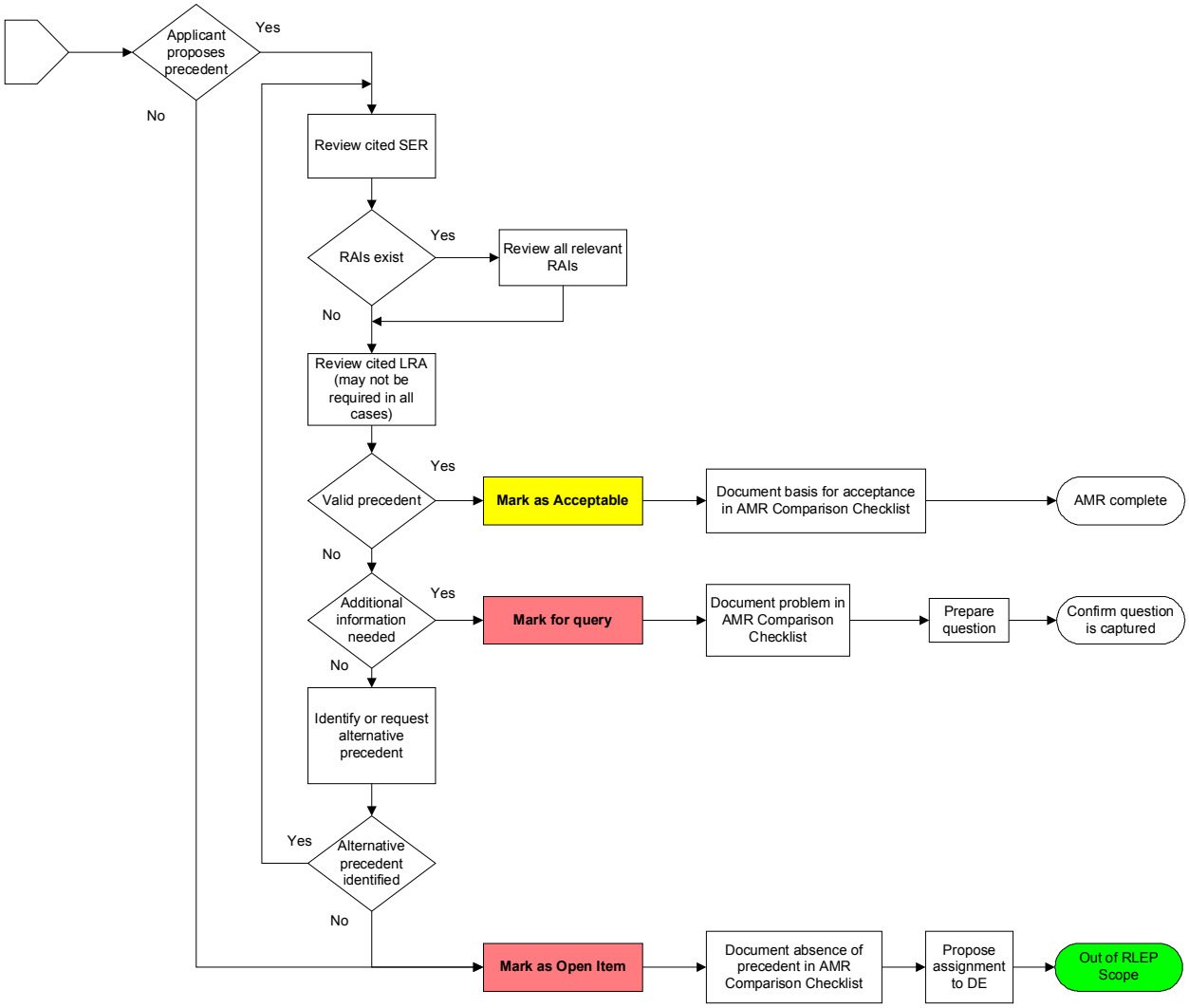

Figure 4. Review of AMRs Using NRC-Approved Precedents

Appendix A

Project Team Membership

Palisades Nuclear Plant Audit and Review Plan

Appendix A

Project Team Membership

Organization	Name	Function
NRC/NRR/DRIP/RLEP-B	Kurt Cozens	Team leader
NRC/NRR/DRIP/RLEP-B	Robert Hsu	Backup team leader
NRC/NRR/DRIP/RLEP-B	Amar Pal	Reviewer - Electrical
ISL	Michael Kennedy	Contractor lead, reviewer - Systems
ISL	Malcolm Patterson	Reviewer – Materials/Systems/ Mechanical
ISL	Farideh Saba	Reviewer - Mechanical
ISL	Jon Woodfield	Reviewer - Structural

Appendix B

RLEP-B Schedule for LRA Safety Review

Palisades Nuclear Plant Audit and Review Plan

Appendix B

RLEP-B Schedule for LRA Safety Review

Plant: Palisades Nuclear Plant **TAC Number:** MC6433
Team Leader: Kurt Cozens
Backup Team Leader: Robert Hsu
Project Manager: Mike Morgan
Contractor: ISL

	Activity/Milestone	Scheduled Completion
1	Receive license renewal application	3/24/05
2	Train project team	5/18–19/05
3	Make review assignments (project manager)	5/7/05
4	Conduct team planning meeting	5/19/05
5	Issue audit plan to project manager	5/18/05
6	Complete pre-write of audit report	5/31/05
7	Conduct on site AMP audit & review	6/20–24/05
8	Draft AMP audit report input	7/13/05
9	Conduct in-office AMR reviews	7/18–22/05
10	Conduct on site AMR audit & review	8/1–5/05
11	Draft AMR audit report input	8/25/05
12	Cutoff for providing RAIs to PM	8/31/05
13	Conduct public exit meeting	9/2/05
14	Peer review of final draft audit and review report	9/21–26/05
15	Issue final audit and review report	10/17/05
16	Draft SER input for AMP reviews	11/9/05
17	Draft SER input for AMR reviews	11/9/05
18	Issue final draft SER input to PM with open items	11/21/05
19	ACRS Subcommittee meeting	6/2006 tentative
20	ACRS Full Committee meeting	11/2006 tentative

Appendix C

Aging Management Program Assignments

Palisades Nuclear Plant Audit and Review Plan

Appendix C

Aging Management Program Assignments

The following AMPs have been assigned to the project team for review.

LRA AMP Number	GALL Report AMP Number	AMP Title	Consistent with GALL Report		Assigned Reviewer
			Yes	No	
B2.1.1	XI.M11	Alloy 600 Program	Yes		Hsu
B2.1.2	XI.M1 XI.M3 XI.S3	ASME Section XI IWB, IWC, IWD, IWF Inservice Inspection Program	Yes		Hsu
B2.1.3	XI.M18	Bolting Integrity Program	Yes		DE
B2.1.4	XI.M10	Boric Acid Corrosion Program	Yes		DE
B2.1.5	XI.M34	Buried Services Corrosion Monitoring Program	Yes		Saba
B2.1.6	XI.M21	Closed Cycle Cooling Water Program	X		Kennedy
B2.1.7	XI.S1 XI.S2 X.S1	Containment Inservice Inspection Program	Yes		Woodfield
B2.1.8	XI.S4	Containment Leakage Testing Program	Yes		Woodfield
B2.1.9	XI.M30	Diesel Fuel Monitoring and Storage Program	X		Kennedy
B2.1.10	XI.M26 XI.M27	Fire Protection Program	X		Saba
B2.1.11	XI.M17	Flow Accelerated Corrosion Program	Yes		Patterson
B2.1.12	XI.E1 XI.E2 XI.E3	Non-EQ Electrical Commodities Condition Monitoring Program	Yes		Pal (XI.EI, XI.E2) DE (XI.E3)
B2.1.13	XI.M29 XI.M32 XI.M33	One-Time Inspection Program	X		Patterson

LRA AMP Number	GALL Report AMP Number	AMP Title	Consistent with GALL Report		Assigned Reviewer
			Yes	No	
B2.1.14	XI.M20	Open Cycle Cooling Water Program	Yes		Kennedy
B2.1.15	XI.M23	Overhead Load Handling Systems Inspection Program	X		Woodfield
B2.1.16	XI.M31	Reactor Vessel Integrity Surveillance Program	Yes		DE
B2.1.17	XI.M16	Reactor Vessel Internals Inspection Program	Yes		Patterson
B2.1.18	XI.M19	Steam Generator Tube Integrity Program	Yes		Saba
B2.1.19	XI.S5 XI.S6 XI.S7	Structural Monitoring Program	Yes		Woodfield
B2.1.20	XI.M29	System Monitoring Program	PS		DE
B2.1.21	XI.M2	Water Chemistry Program	Yes		Saba
B3.1*	X.E1	Electrical Equipment Qualification Program	Yes		Pal
B3.2	X.M1	Fatigue Monitoring Program	Yes		Patterson/Hsu
DE = Division of Engineering PS = plant specific X = with exceptions					

*Note: This LRA AMP is a Time-Limited Aging Analysis (TLAA) which has been assigned to the project team. Refer to Section 4 of some recent SERs for guidance on documenting the review of this AMP.

Appendix D

Aging Management Review Assignments

Palisades Nuclear Plant Audit and Review Plan

Appendix D

Aging Management Review Assignments

Aging Management Reviews	Reviewer
3.1 Aging Management of Reactor Coolant System	Patterson
3.2 Aging Management of Engineered Safety Features	Patterson
3.3 Aging Management of Auxiliary Systems	Saba
3.4 Aging Management of Steam and Power Conversion System	Kennedy
3.5 Aging Management of Containments, Structures, and Component Supports	Woodfield
3.6 Aging Management of Electrical and Instrumentation and Controls	Pal

The specific AMRs to be reviewed by the project team are shown in the work-split tables which are available on ADAMS (ML051380078). The project team will review all the AMRs identified in the table except those that are highlighted on the work-split tables. The results of those evaluations will be reported in Section 3 of the PNP SER.

Appendix E

Consistent with GALL Report AMP Audit/Review Worksheets

Palisades Nuclear Plant Audit and Review Plan

Table of Contents for Worksheets

Palisades Nuclear Plant Audit and Review Plan

Appendix E

Consistent with GALL Report AMP Audit/Review Worksheets

The worksheets provided in this appendix provide, as an aid for the reviewer, a process for documenting the basis for the assessment of the elements and sub-elements contained in the GALL Report AMPs (Chapter XI of NUREG-1801, Volume 2). The worksheets are organized into packages with a package for each AMP reviewed by the project team. Some packages have multiple worksheets. One worksheet is provided for each GALL Report AMP referenced by the LRA AMP. The worksheets provide a systematic method for recording the basis for assessments or to identify when the applicant needs to provide clarification or additional information. Information recorded in the worksheets will also be used to prepare the audit and review report and the safety evaluation report input.

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.1 Alloy 600 Program

This AMP requires auditing against the following criteria:

XI.M11-A NICKEL-ALLOY PENETRATION NOZZLES WELDED TO THE UPPER REACTOR VESSEL CLOSURE HEADS OF PRESSURIZED WATER REACTORS (PWRS Only)

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.1 Alloy 600 Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.M11-A NICKEL-ALLOY PENETRATION NOZZLES WELDED TO THE UPPER REACTOR VESSEL CLOSURE HEADS OF PRESSURIZED WATER REACTORS (PWRS Only)

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** This program is established to ensure that augmented inservice inspections (ISI) of all nickel-alloy vessel head penetration (VHP) nozzles welded to the upper reactor vessel (RV) head of a PWR-designed light-water reactor will continue to be performed as mandated by the interim requirements in Order EA-03-009, "Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors", as amended by the First Revision of the Order, or by any subsequent NRC requirements that may be established to supercede the requirements of Order EA-03-009.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** The Order, as amended, established a mandated augmented inspection process for upper VHP nozzles and upper RV heads that supplements the leakage tests and visual VT-2 examinations requirements established in Section XI of the ASME Boiler and Pressure Vessel Code, Table IWB-2500-1, Examination Category B-P. The interim requirements of the Order, as amended, also established the NRC's required technical method for calculating the susceptibility ranking of a plant's upper VHP nozzles to PWSCC and a required process for establishing the inspection methods and inspection frequencies for a plant's VHP nozzles in accordance with its susceptibility ranking.	
1. Scope of Program	**A** The program is focused on managing the effects of crack initiation and growth due to PWSCC of the nickel-alloy used in the fabrication of the upper VHP nozzles at PWR-designed nuclear facilities.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment
"	**B** The scope of this AMP is limited to upper VHP nozzles, including control rod drive mechanism (CRDM) nozzles, control element drive mechanism (CEDM) nozzles, thermocouples (TC) nozzles, in-core instrumentation (ICI) nozzles, and vent line nozzles; associated J-groove welds; and adjoining upper RV closure heads..	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment
2. Preventive Actions:	**A** Preventive measures to mitigate PWSCC are in accordance with PWR water chemistry guidelines for primary coolant systems, as established in EPRI Topical Report TR-105714 (applicants for license renewal may credit the version of the report on record at the facility at the time of submittal of its application).	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
3. Parameters Monitored/Inspected:	**A** The program monitors for cracking/PWSCC and loss of material/wastage in the upper VHP nozzles to ensure the structural integrity of the VHP nozzles prior to a loss of their intended safety function. The program also monitors for evidence of reactor coolant leakage as a result of through-wall cracks that may exist in the upper VHP nozzles or their associated partial penetration J-groove welds. Evidence of reactor coolant leakage may manifest itself in the form of boric acid residues on the upper RV head or adjacent components or in the form of corrosion products that result from rusting of the low-alloy steel materials used to fabricate the RVs.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** Implementation of inspections required by the Order, as amended, or any subsequent NRC requirements, as applicable, assures detection of cracks in the upper VHP nozzles and any loss of material/wastage of the upper RV head prior to a loss of intended function of the components.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** As required by the Order, as amended, inspection schedules and frequencies for the applicant's VHP nozzles are implemented in accordance with required frequencies for the plant's susceptibility category (i.e., in accordance with the specific inspection frequencies required for "Low", "Moderate", "High", or "Replaced" susceptibility categories, as based on the "total effective degradation years"). Any deviations from implementing the required inspection frequencies mandated by the Order, as amended, will be submitted for NRC review and approval in accordance with the Order, as amended. Disposition of flaw indications detected during required examinations is implemented in accordance with the Acceptance Criteria and Corrective Actions program attributes of this AMP.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
6. Acceptance Criteria:	**A** Relevant flaw indications detected as a result of the augmented inspections of the upper VHP nozzles are to be evaluated in accordance with acceptable flaw evaluation criteria provided in a letter from Mr. Richard Barrett, NRC, Office of Nuclear Reactor Regulation (NRR), Division of Engineering to Alex Marion, Nuclear Energy Institute (NEI), dated April 11, 2003, or in accordance with NRC-approved Code Cases that incorporate the flaw evaluation procedures and criteria of the NRC=s April 11, 2003, letter to NEI.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** There is documentation of PWSCC occurring in the VHP nozzles of U.S. PWRs, as described in the program description above. In addition to these generic communications, applicants for license renewal should reference plant-specific operating experience that is applicable to PWSCC of its VHP nozzles.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
1.				
2.				
…				

ENHANCEMENTS

Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
1.				
2.				
…				

Document Reviewed During Audit:

DOCUMENT NUMBER	IDENTIFIER (NUMBER)	TITLE	REVISION AND/OR DATE
1.			
2.			
3.			
4.			
….			

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.2 ASME Section XI IWB, IWC, IWD, IWF Inservice Inspection Program

This AMP requires auditing against the following three (3) GALL AMPs:

XI.M1 ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD
XI.M3 Reactor Head Closure Studs
XI.S3 ASME Section XI, Subsection IWF

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.2 ASME Section XI IWB, IWC, IWD, IWF Inservice Inspection Program

REVIEWER: _____

DATE: _____

GALL AMP: XI.M1 ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The Code of Federal Regulations, 10 CFR 50.55a, imposes the inservice inspection (ISI) requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, for Class 1, 2, and 3 pressure-retaining components and their integral attachments in light-water cooled power plants. Inspection, repair, and replacement of these components are covered in Subsections IWB, IWC, and IWD, respectively, in the 1995 edition through the 1996 addenda. The program generally includes periodic visual, surface, and/or volumetric examination and leakage test of all Class 1, 2, and 3 pressure-retaining components and their integral attachments. The ASME Section XI inservice inspection program in accordance with Subsections IWB, IWC, or IWD has been shown to be generally effective in managing aging effects in Class 1, 2, or 3 components and their integral attachments in light-water cooled power plants. However, in certain cases, the ASME inservice inspection program is to be augmented to manage effects of aging for license renewal and is so identified in the GALL Report.	**Consistent with GALL AMP:** ☐ Yes ☐ No **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
1. Scope of Program	**A** The ASME Section XI program provides the requirements for ISI, repair, and replacement. The components within the scope of the program are specified in Subsections IWB-1100, IWC-1100, and IWD-1100 for Class 1, 2, and 3 components, respectively, and include all pressure-retaining components and their integral attachments in light-water cooled power plants.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**B** The components described in Subsections IWB-1220, IWC-1220, and IWD-1220 are exempt from the examination requirements of Subsections IWB-2500, IWC-2500, and IWD-2500.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
2. Preventive Actions:	**A** The ASME Section XI does not provide guidance on methods to mitigate degradation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** The ASME Section XI ISI program detects degradation of components by using the examination and inspection requirements specified in ASME Section XI Tables IWB-2500-1, IWC-2500-1, or IWD-2500-1, respectively, for Class 1, 2, or 3 components.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
4. Detection of Aging Effects:	**A** The extent and schedule of the inspection and test techniques prescribed by the program are designed to maintain structural integrity and ensure that aging effects will be discovered and repaired before the loss of intended function of the component.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Components are examined and tested as specified in Tables IWB-2500-1, IWC-2500-1, and IWD-2500-1, respectively, for Class 1, 2, and 3 components. The tables specify the extent and schedule of the inspection and examination methods for the components of the pressure-retaining boundaries. Alternative approved methods that meet the requirements of IWA-2240 are also specified in these tables.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** The program uses three types of examination — visual, surface, and volumetric — in accordance with the general requirements of Subsection IWA-2000.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**D** For BWRs, the nondestructive examination (NDE) techniques appropriate for inspection of vessel internals and their implementation needs, including the uncertainties inherent in delivering and executing and NDE technique in a boiling water reactor (BWR), are included in the approved boiling water reactor vessel and internals project (BWRVIP)-03. Also, an applicant may use the guidelines of the approved BWRVIP-62 for inspection relief for vessel internal components with hydrogen water chemistry.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
5. Monitoring and Trending:	**A** For Class 1, 2, or 3 components, the inspection schedule of IWB-2400, IWC-2400, or IWD-2400, respectively, and the extent and frequency of IWB-2500-1, IWC-2500-1, or IWD-2500-1, respectively, provides for timely detection of degradation.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** If flaw indications or relevant conditions of degradation are evaluated in accordance with IWB-3100 or IWC-3100, and the component is qualified as acceptable for continued service, the areas containing such flaw indications and relevant conditions are reexamined during the next three inspection periods of IWB-2410 for Class 1 components and for the next inspection period of IWC-2410 for Class 2 components.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Examinations that reveal indications that exceed the acceptance standards described below are extended to include additional examinations in accordance with IWB-2430, IWC-2430, or IWD-2430 (1995 edition) for Class 1, 2, or, 3 Components, respectively.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment
6. Acceptance Criteria:	**A** Any indication or relevant conditions of degradation detected are evaluated in accordance with IWB-3000, IWC-3000, or IWD-3000, for Class 1, 2, or 3 components, respectively.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Examination results are evaluated in accordance with IWB-3100 or IWC-3100 by comparing the results with the acceptance standards of IWB-3400 and IWB-3500 or IWC-3400 and IWC-3500, respectively, for Class 1 or Class 2 and 3 components.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** Flaws that exceed the size of allowable flaws, as defined in IWB-3500 or IWC-3500, are evaluated by using the analytical procedures of IWB-3600 or IWC-3600, respectively, for Class 1 or Class 2 and 3 components.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
	D Approved BWRVIP-14, BWRVIP-59, and BWRVIP-60 documents provide guidelines for evaluation of crack growth steels, nickel alloys, and low-alloy steels, respectively.	
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** Because the ASME Code is a consensus document that has been widely used over a long period, it has been shown to be generally effective in managing aging effects in Class 1, 2, and 3 components and their integral attachments in light-water cooled power plants (see Chapter I of the GALL Report, Vol. 2).	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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ENHANCEMENTS

Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
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AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.2 ASME Section XI IWB, IWC, IWD, IWF Inservice Inspection Program

REVIEWER: _____

DATE: _____

GALL AMP: XI.M3 Reactor Head Closure Studs

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** This program includes inservice inspection (ISI) in conformance with the requirements of the American Society of Mechanical Engineers (ASME), Code, Section XI, Subsection IWB (1995 edition through the 1996 addenda), Table IWB 2500-1.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The program includes preventive measures to mitigate cracking.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
1. Scope of Program	**A** ISI to detect crack initiation and growth due to stress corrosion cracking (SCC) or intergranular stress corrosion cracking (IGSCC); loss of material due to wear; and coolant leakage from reactor vessel closure stud bolting for both boiling water reactors (BWRs) and pressurized water reactors (PWRs).	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** preventive measures of NRC Regulatory Guide 1.65 to mitigate cracking.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**C** The program is applicable to closure studs and nuts constructed from materials with a maximum tensile strength limited to less than 1,172 MPa (170 ksi) (Nuclear Regulatory Commission [NRC] Regulatory Guide [RG] 1.65).	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
2. Preventive Actions:	**A** preventive measures include avoiding the use of metal-plated stud bolting to prevent degradation due to corrosion or hydrogen embrittlement.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** to use manganese phosphate or other acceptable surface treatments and stable lubricants (RG 1.65).	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
3. Parameters Monitored/Inspected:	**A** The ASME Section XI ISI program detects and sizes cracks, detects loss of material, and detects coolant leakage by following the examination and inspection requirements specified in Table IWB-2500-1.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** The extent and schedule of the inspection and test techniques prescribed by the program are designed to maintain structural integrity and ensure that aging effects will be discovered and repaired before the loss of intended function of the component. Inspection can reveal crack initiation and growth, loss of material due to corrosion or wear, and leakage of coolant.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The program uses visual, surface, and volumetric examinations in accordance with the general requirements of Subsection IWA-2000.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Components are examined and tested as specified in Table IWB-2500-1.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**D** Examination category B-G-1, for pressure-retaining bolting greater than 2 in. in diameter in reactor vessels specifies volumetric examination of studs in place, from the top of the nut to the bottom of the flange hole, and surface and volumetric examination of studs when removed.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**E** Also specified are volumetric examination of flange threads and visual VT-1 examination of surfaces of nuts, washers, and bushings.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**F** Examination category B-P for all pressure-retaining components, specifies visual VT-2 examination of all pressure-retaining boundary components during the system leakage test and the system hydrostatic test.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** The Inspection schedule of IWB-2400, and the extent and frequency of IWB-2500-1 provide timely detection of cracks, loss of material, and leakage.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
6. Acceptance Criteria:	**A** Any indication or relevant condition of degradation in closure stud bolting is evaluated in accordance with IWB-3100 by comparing ISI results with the acceptance standards of IWB-3400 and IWB-3500.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** The SCC has occurred in BWR pressure vessel head studs (Stoller 1991). The aging management program (AMP) has provisions regarding inspection techniques and evaluation, material specifications, corrosion prevention, and other aspects of reactor pressure vessel head stud cracking. Implementation of the program provides reasonable assurance that the effects of cracking due to SCC or IGSCC and loss of material due to wear will be adequately managed so that the intended functions of the reactor head closure studs and bolts will be maintained consistent with the current licensing basis.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

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AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.2 ASME Section XI IWB, IWC, IWD, IWF Inservice Inspection Program

REVIEWER: _____

DATE: _____

GALL AMP: XI.S3 ASME Section XI, Subsection IWF

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The10 CFR 50.55a imposes the inservice inspection (ISI) requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, for Class 1, 2, 3, and MC piping and components and their associated supports. Inservice inspection of supports for ASME piping and components is addressed in Section XI, Subsection IWF. This evaluation covers the 1989 Edition through the 1995 Edition and addenda through the 1996 Addenda, as approved in 10 CFR 50.55a. ASME Code Section XI, Subsection IWF constitutes an existing mandated program applicable to managing aging of ASME Class 1, 2, 3, and MC supports for license renewal.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** The IWF scope of inspection for supports is based on sampling of the total support population. • The sample size varies depending on the ASME Class. The largest sample size is specified for the most critical supports (ASME Class 1). • The sample size decreases for the less critical supports (ASME Class 2 and 3). • Discovery of support deficiencies during regularly scheduled inspections triggers an increase of the inspection scope, in order to ensure that the full extent of deficiencies is identified. • The primary inspection method employed is visual examination. • Degradation that potentially compromises support function or load capacity is identified for evaluation. • IWF specifies acceptance criteria and corrective actions. • Supports requiring corrective actions are re-examined during the next inspection period.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
1. Scope of Program	**A** For Class 1 piping and component supports, Subsection IWF (1989 edition) refers to Subsection IWB for the inspection scope and schedule. • According to Table IWB-2500-1, only 25% of nonexempt supports are subject to examination. Supports exempt from examination are the supports for piping systems that are exempt from examination, according to pipe diameter or service. • The same supports are inspected in each 10-year inspection interval.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** For Class 2, 3, and MC piping and component supports, Subsection IWF (1989 edition) refers to Subsections IWC, IWD, and IWE for the inspection scope and schedule. • According to Table IWC-2500-1, 7.5% of nonexempt supports are subject to examination for Class 2 systems. • The same supports are inspected in each 10-year inspection interval.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** No specific numerical percentages are identified in Subsections IWD and IWE for Class 3 and Class MC, respectively.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
2. Preventive Actions:	**A** No preventive actions are specified; Subsection IWF is a inspection program.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** IWF specifies visual examination (VT-3) of supports. • The parameters monitored or inspected include corrosion; deformation; misalignment; improper clearances; improper spring settings; damage to close tolerance machined or sliding surfaces; and missing, detached, or loosened support items. • The visual inspection would be expected to identify relatively large cracks.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** VT-3 visual examination is specified in Table IWF-2500-1. • The complete inspection scope is repeated every 10-year inspection interval. • The qualified VT-3 inspector uses judgment in assessing general corrosion; observed degradation is documented if loss of structural capacity is suspected.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
5. Monitoring and Trending:	**A** There is no requirement to monitor or report progressive, time-dependent degradation. Unacceptable conditions, according to IWF-3400, are noted for correction or further evaluation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** The acceptance standards for visual examination are specified in IWF-3400.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** To date, IWF sampling inspections have been effective in managing aging effects for ASME Class 1, 2, 3, and MC supports. There is reasonable assurance that the Subsection IWF inspection program will be effective through the period of extended operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.5 Buried Services Corrosion Monitoring Program

This AMP requires auditing against the following GALL AMP:

XI.M34 Buried Piping and Tanks Inspection

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.5 Buried Services Corrosion Monitoring Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.M34 Buried Piping and Tanks Inspection

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The program includes preventive measures to mitigate corrosion.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** periodic inspection to manage the effects of corrosion on the pressure-retaining capacity of buried carbon steel piping and tanks.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Preventive measures are in accordance with standard industry practice for maintaining external coatings and wrappings.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**D** Buried piping and tanks are inspected when they are excavated during maintenance and when a pipe is dug up and inspected for any reason.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**E** this is an acceptable option to manage buried components, except for the program element/attributes of detection of aging effects (regarding inspection frequency) and operating experience. Thus, the staff further evaluates an applicant's inspection frequency and operating experience with buried components.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
1. Scope of Program	**A** The program relies on preventive measures such as coating and wrapping and periodic inspection for loss of material caused by corrosion of the external surface of buried carbon steel piping and tanks . Loss of material in these components, which may be exposed to aggressive soil environment, is caused by general, pitting, and crevice corrosion, and microbiologically influenced corrosion (MIC).	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**B** Periodic inspections are performed when the components are excavated for maintenance or for any other reason.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
2. Preventive Actions:	**A** In accordance with industry practice, underground piping and tanks are coated during installation with a protective coating system to protect the piping from contacting the aggressive soil environment.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
3. Parameters Monitored/Inspected:	**A** The program monitors parameters such as coating and wrapping integrity that are directly related to corrosion damage of the external surface of buried carbon steel piping and tanks. Coatings and wrappings are inspected by visual techniques.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Any evidence of damaged wrapping or coating defects is an indicator of possible corrosion damage to the external surface of piping and tanks.	
4. Detection of Aging Effects:	**A** Periodic inspection of susceptible locations to confirm that coating and wrapping are intact.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The inspections are performed in areas with the highest likelihood of corrosion problems, and in areas with a history of corrosion problems.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** Because the inspection frequency is plant specific and also depends on the plant operating experience, the applicant's proposed inspection frequency is to be further evaluated for the extended period of operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** Results of previous inspections are used to identify susceptible locations.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** Any coating and wrapping degradations are reported and evaluated according to site corrective actions procedures.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** Operating experience shows that the program described here is effective in managing corrosion of external surfaces of buried carbon steel components. However, because the inspection frequency is plant specific and also depends on the plant operating experience, the applicant's plant-specific operating experience is further evaluated for the extended period of operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.6 Closed Cycle Cooling Water Program

This AMP requires auditing against the following GALL AMP:

XI.M21 Closed-Cycle Cooling Water System

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.6 Closed Cycle Cooling Water Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.M21 Closed-Cycle Cooling Water System

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The program includes (a) preventive measures to minimize corrosion and (b) surveillance testing and inspection to monitor the effects of corrosion on the intended function of the component.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The program relies on maintenance of system corrosion inhibitor concentrations within specified limits of Electric Power Research Institute [EPRI] TR-107396 to minimize corrosion.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Surveillance testing and inspection in accordance with standards in EPRI TR-107396 for closed-cycle cooling water (CCCW) systems is performed to evaluate system and component performance.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
1. Scope of Program	**A** A CCCW system is defined as part of the service water system that is not subject to significant sources of contamination, in which water chemistry is controlled and in which heat is not directly rejected to a heat sink. The program described in this section applies only to such a system. If one or more of these conditions are not satisfied, the system is to be considered an open-cycle cooling water system. The staff notes that If the adequacy of cooling water chemistry control can not be confirmed, the system is treated as an open-cycle system as indicated in Action III of Generic Letter (GL) 89-13.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
2. Preventive Actions:	**A** The program relies on the maintenance of system corrosion inhibitor concentrations within specified limits of EPRI TR-107396.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The program includes monitoring and control of cooling water chemistry to minimize exposure to aggressive environments.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** application of corrosion inhibitor in the CCCW system to mitigate general, crevice, and pitting corrosion.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
3. Parameters Monitored/Inspected:	**A** surveillance testing and inspection in accordance with standards in EPRI TR-107396 to evaluate system and component performance.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** For pumps, the parameters monitored include flow and discharge and suction pressures.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** For heat exchangers, the parameters monitored include flow, inlet and outlet temperatures, and differential pressure.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** The extent and schedule of inspections and testing in accordance with EPRI TR-107396.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** Performance and functional testing in accordance with EPRI TR-107396.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**C** For systems and components in continuous operation, performance adequacy is determined by monitoring data trends for evaluation of heat transfer fouling, pump wear characteristics, and branch flow changes.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**D** Components not in operation are periodically tested to ensure operability.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** Frequency of sampling water chemistry varies and can occur on a continuous, daily, weekly, or as needed basic, as indicated by plant operating conditions.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** Per EPRI TR-107396, performance and functional tests are performed at least every 18 months to demonstrate system operability.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** tests to evaluate heat removal capability of the system and degradation of system components are performed every five years . The testing intervals may be adjusted on the basis of the results of the reliability analysis, type of service, frequency of operation, or age of components and systems.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**D** The testing intervals may be adjusted on the basis of the results of the reliability analysis, type of service, frequency of operation, or age of components and systems.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** Corrosion inhibitor concentrations are maintained within the limits specified in the EPRI water chemistry guidelines for CCCW.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** System and component performance test results are evaluated in accordance with the guidelines of EPRI TR-107396.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Acceptance criteria and tolerances are also based on system design parameters and functions.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** Degradation of closed-cycle cooling water systems due to corrosion product buildup (NRC Licensee Event Report [LER] 93-029-00) or through-wall cracks in supply lines (NRC LER 91-019-00) has been observed in operating plants. Accordingly, operating experience demonstrates the need for this program.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.7 Containment Inservice Inspection Program

This AMP requires auditing against the following three (3) GALL AMPs:

X.S1 Concrete Containment Tendon Prestress
XI.S1 ASME Section XI, Subsection IWE
XI.S2 ASME Section XI, Subsection IWL

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.7 Containment Inservice Inspection Program

REVIEWER: _____
DATE: _____

GALL AMP: X.S1 Concrete Containment Tendon Prestress

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** In order to ensure the adequacy of prestressing forces in prestressed concrete containments during the extended period of operation, an applicant shall develop an aging management program (AMP) under 10 CFR 54.21(c)(1)(iii).	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
	B The AMP consists of an assessment of the results of inspections performed in accordance with the requirements of Subsection IWL of the ASME Section XI Code, as supplemented by the requirements of 10 CFR 50.55a(b)(2)(ix) or (viii) in the later amendment of the regulation. The assessment related to the adequacy of the prestressing force will consist of the establishment of (1) acceptance criteria and (2) trend lines. The acceptance criteria will normally consist of predicted lower limit (PLL) and the minimum required prestressing force, also called minimum required value (MRV). NRC Regulatory Guide 1.35.1 provides guidance for calculating PLL and MRV. The trend line represents the trend of prestressing forces based on the actual measured forces. NRC Information Notice IN 99-10 provides guidance for constructing the trend line. The goal is to keep the trend line above the PLL because, as a result of any inspection performed in accordance with ASME Section XI, Subsection IWL, if the trend line crosses the PLL, the existing prestress in the containment could go below the MRV soon after the inspection and would not meet the requirements of 10 CFR 50.55a(b)(2)(ix)(B) or 10 CFR 50.55a(b)(2)(viii)(B).	
	C As evaluated below, this is an acceptable option to manage containment tendon prestress force, except for the program element/attribute regarding operating experience. Thus, it is recommended that the staff should further evaluate an applicant's operating experience related to the containment prestress force.	
	D The AMP related to the adequacy of prestressing force for containments with grouted tendons will be reviewed on a case-by-case basis.	

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
1. Scope of Program	The program addresses the assessment of containment prestressing force when an applicant chooses to perform the containment prestress force TLAA using 10 CFR 54.21(c)(1)(iii).	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
2. Preventive Actions:	Maintaining the prestress above the MRV, as described under program description above, will ensure that the structural and functional adequacy of the containment are maintained.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	The parameters to be monitored are the containment prestressing forces in accordance with requirements specified in Subsection IWL of Section XI of the ASME Code, as incorporated by reference in 10 CFR 50.55a.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	The loss of containment prestressing forces is detected by the program.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
5. Monitoring and Trending:	The estimated and measured prestressing forces are plotted against time and the PLL, MRV, and trending lines developed for the period of extended operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	The prestressing force trend lines indicate that existing prestressing forces in the containment would not be below the MRVs prior to the next scheduled inspection, as required by 10 CFR 50.55a(b)(2)(ix)(B) or 10 CFR 50.55a(b)(2)(viii)(B).	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	If acceptance criteria are not met, then either systematic retensioning of tendons or a reanalysis of the containment is warranted to ensure the design adequacy of the containment. As discussed in the appendix to this report, the staff finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address corrective actions.	N/A
8. Confirmation Process:	As discussed in the appendix to this report, the staff finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address the confirmation process.	N/A
9. Administrative Controls:	As discussed in the appendix to this report, the staff finds the requirements of 10 CFR Part 50, Appendix B, acceptable to address administrative controls.	N/A
10. Operating Experience:	The program incorporates the relevant operating experience that has occurred at the applicant's plant as well as at other plants. The applicable portions of the experience with prestressing systems described in NRC Information Notice 99-10 could be useful for the purpose. However, tendon operating experience could be different at plants with prestressed concrete containments. The difference could be due to the prestressing system design (e.g., button-headed, wedge, or swaged anchorages), environment, and type of reactor (i.e., PWR and BWR). Thus, the applicant's plant-specific operating experience should be further evaluated for license renewal.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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ENHANCEMENTS

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AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.7 Containment Inservice Inspection Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.S1 ASME Section XI, Subsection IWE

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The evaluation of 10 CFR 50.55a and Subsection IWE as an aging management program (AMP) for license renewal is provided below. 10 CFR 50.55a imposes the inservice inspection (ISI) requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, Subsection IWE for steel containments (Class MC) and steel liners for concrete containments (Class CC). The full scope of IWE includes steel containment shells and their integral attachments; steel liners for concrete containments and their integral attachments; containment hatches and airlocks; seals, gaskets and moisture barriers; and pressure-retaining bolting. This evaluation covers both the 1992 Edition with the 1992 Addenda and the 1995 Edition with the 1996 Addenda, as approved in 10 CFR 50.55a. ASME Code Section XI, Subsection IWE and the additional requirements specified in 10 CFR 50.55a(b)(2) constitute an existing mandated program applicable to managing aging of steel containments, steel liners of concrete containments, and other containment components for license renewal.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
1. Scope of Program	**A** Subsection IWE-1000 specifies the components of steel containments and steel liners of concrete containments within its scope. • The components within the scope of Subsection IWE are Class MC pressure-retaining components (steel containments) and their integral attachments; metallic shell and penetration liners of Class CC containments and their integral attachments; containment seals and gaskets; containment pressure-retaining bolting; and metal containment surface areas, including welds and base metal.	**Consistent with GALL AMP: ☐ Yes ☐No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Subsection IWE exempts the following from examination: (1) Components that are outside the boundaries of the containment as defined in the plant-specific design specification; (2) Embedded or inaccessible portions of containment components that met the requirements of the original construction code of record; (3) Components that become embedded or inaccessible as a result of vessel repair or replacement, provided IWE-1232 and IWE-5220 are met; and (4) Piping, pumps, and valves that are part of the containment system or that penetrate or are attached to the containment vessel (governed by IWB or IWC).	**Consistent with GALL AMP: ☐ Yes ☐No** **Document(s) used to confirm Criteria:** Comment:
"	**C** The 10 CFR 50.55a(b)(2)(ix) specifies additional requirements for inaccessible areas. It states that the licensee is to evaluate the acceptability of inaccessible areas when conditions exist in accessible areas that could indicate the presence of or result in degradation to such inaccessible areas. • Examination requirements for containment supports are not within the scope of Subsection IWE.	**Consistent with GALL AMP: ☐ Yes ☐No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
2. Preventive Actions:	**A** No preventive actions are specified; Subsection IWE is a monitoring program.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** Table IWE-2500-1 specifies seven categories for examination. Table IWE-2500-1 references the applicable section in IWE-3500 that identifies the aging effects that are evaluated. The parameters monitored or inspected depend on the particular examination category.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** The frequency and scope of examination specified in 10 CFR 50.55a and Subsection IWE ensure that aging effects would be detected before they would compromise the design-basis requirements.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** With the exception of inaccessible areas, all surfaces are monitored by virtue of the examination requirements on a scheduled basis.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** When component examination results require evaluation of flaws, evaluation of areas of degradation, or repairs, and the component is found to be acceptable for continued service, the areas containing such flaws, degradation, or repairs shall be reexamined during the next inspection period, in accordance with Examination Category E-C. • When these reexaminations reveal that the flaws, areas of degradation, or repairs remain essentially unchanged for three consecutive inspection periods, these areas no longer require augmented examination in accordance with Examination Category E-C.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** IWE-2430 specifies that (a) examinations performed during any one inspection that reveal flaws or areas of degradation exceeding the acceptance standards are to be extended to include an additional number of examinations within the same category approximately equal to the initial number of examinations, and (b) when additional flaws or areas of degradation that exceed the acceptance standards are revealed, all of the remaining examinations within the same category are to be performed to the extent specified in Table IWE-2500-1 for the inspection interval.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**D** Alternatives to these examinations are provided in 10 CFR 50.55a(b)(2)(ix)(D).	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** IWE-3000 provides acceptance standards for components of steel containments and liners of concrete containments.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** Table IWE-3410-1 presents criteria to evaluate the acceptability of the containment components for service following the preservice examination and each inservice examination. This table specifies the acceptance standard for each examination category.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** ASME Section XI, Subsection IWE was incorporated into 10 CFR 50.55a in 1996. Prior to this time, operating experience pertaining to degradation of steel components of containment was gained through the inspections required by 10 CFR Part 50, Appendix J and ad hoc inspections conducted by licensees and the Nuclear Regulatory Commission (NRC). NRC Information Notice (INs) 86-99, 88-82 and 89-79 described occurrences of corrosion in steel containment shells. NRC Generic Letter (GL) 87-05 addressed the potential for corrosion of boiling water reactor (BWR) Mark I steel drywells in the "sand pocket region." More recently, NRC IN 97-10 identified specific locations where concrete containments are susceptible to liner plate corrosion. The program is to consider the liner plate and containment shell corrosion concerns described in these generic communications. Implementation of the ISI requirements of Subsection IWE, in accordance with 10 CFR 50.55a, is a necessary element of aging management for steel components of steel and concrete containments through the period of extended operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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ENHANCEMENTS

Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
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AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.7 Containment Inservice Inspection Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.S2 ASME Section XI, Subsection IWL

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The evaluation of 10 CFR 50.55a and Subsection IWL as an aging management program (AMP) for license renewal is provided below. 10 CFR 50.55a imposes the examination requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel (B&PV) Code, Section XI, Subsection IWL for reinforced and prestressed concrete containments (Class CC). The scope of IWL includes reinforced concrete and unbonded post-tensioning systems. This evaluation covers both the 1992 Edition with the 1992 Addenda and the 1995 Edition with the 1996 Addenda, as approved in 10 CFR 50.55a. ASME Code Section XI, Subsection IWL and the additional requirements specified in 10 CFR 50.55a(b)(2) constitute an existing mandated program applicable to managing aging of containment reinforced concrete and unbonded post-tensioning systems for license renewal. IWL specifies acceptance criteria, corrective actions, and expansion of the inspection scope when degradation exceeding the acceptance criteria is found.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
1. Scope of Program	**A** Subsection IWL-1000 specifies the components of concrete containments within its scope. The components within the scope of Subsection IWL are reinforced concrete and containments, as defined by CC-1000. Subsection IWL exempts from examination portions of the concrete containment that are inaccessible (e.g., concrete covered by liner, foundation material, or backfill, or obstructed by adjacent structures or other components). 10 CFR 50.55a(b)(2)(viii) specifies additional requirements for inaccessible areas. It states that the licensee is to evaluate the acceptability of concrete in inaccessible areas when conditions exist in accessible areas that could indicate the presence of or result in degradation to such inaccessible areas. Steel liners for concrete containments and their integral attachments are not within the scope of Subsection IWL, but are included within the scope of Subsection IWE.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
2. Preventive Actions:	**A** No preventive actions are specified; Subsection IWL is a monitoring program.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** Table IWL-2500-1 specifies seven categories for Examination of concrete surfaces: Category L-A for all concrete surfaces and Category L-B for concrete surfaces surrounding tendon anchorages. Both of these categories rely on visual examination methods.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** Concrete surfaces are examined for evidence of damage or degradation, such as concrete cracks. IWL-2510 specifies that concrete surfaces are examined for conditions indicative of degradation, such as those defined in ACI 201.1R-77.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Table IWL-2500-1 also specifies Category L-B for test and examination requirements for unbonded post tensioning systems. Tendon anchorage and wires or strands are visually examined for cracks, corrosion, and mechanical damage. Tendon wires or strands are also tested for yield strength, ultimate tensile strength, and elongation. Tendon corrosion protection medium is tested by analysis for alkalinity, water content, and soluble ion concentrations.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** The frequency and scope of examination specified in 10 CFR 50.55a and Subsection IWL ensure that aging effects would be detected before they would compromise the design-basis requirements.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Concrete inspections are performed in accordance with Examination Category L-A. Under Subsection IWL, inservice inspections for concrete and unbonded post-tensioning systems are required at one, three, and five years following the structural integrity test. • Thereafter, inspections are performed at five-year intervals. • For sites with two plants, the schedule for inservice inspection is provided in IWL-2421.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** In the case of tendons, only a sample of the tendons of each tendon type requires examination at each inspection. • The tendons to be examined during an inspection are selected on a random basis. • Table IWL-2521-1 specifies the number of tendons to be selected for each type (e.g., hoop, vertical, dome, helical, and inverted U) for each inspection period. • The minimum number of each tendon type selected for inspection varies from 2 to 4%.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**D** Regarding detection methods for aging effects, all concrete surfaces receive a visual VT-3C examination. • Selected areas, such as those that indicate suspect conditions and areas surrounding tendon anchorages, receive a more rigorous VT-1 or VT-1C examination.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**E** Prestressing forces in sample tendons are measured. • In addition, one sample tendon of each type is detensioned. A single wire or strand is removed from each detensioned tendon for examination and testing. • These visual examination methods and testing would identify the aging effects of accessible concrete components and prestressing systems in concrete containments.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** Except in inaccessible areas, all concrete surfaces are monitored on a regular basis by virtue of the examination requirements. **B** For prestressed containments, trending of prestressing forces in tendons is required in accordance with paragraph (b)(2)(viii) of 10 CFR 50.55a.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** For prestressed containments, trending of prestressing forces in tendons is required in accordance with paragraph (b)(2)(viii) of 10 CFR 50.55a. • In addition to the random sampling used for tendon examination, one tendon of each type is selected from the first-year inspection sample and designated as a common tendon. • Each common tendon is then examined during each inspection.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** 10 CFR 50.55a and Subsection IWL also require that prestressing forces in all inspection sample tendons be measured by lift-off tests and compared with acceptance standards based on the predicted force for that type of tendon over its life.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** IWL-3000 provides acceptance criteria for concrete containments. For concrete surfaces, the acceptance criteria rely on the determination of the "Responsible Engineer" (as defined by the ASME Code) regarding whether there is any evidence of damage or degradation sufficient to warrant further evaluation or repair. • The acceptance criteria are qualitative; guidance is provided in IWL-2510, which references ACI 201.1R-77 for identification of concrete degradation. • Quantitative acceptance criteria based on the "Evaluation Criteria" provided in Chapter 5 of ACI 349.3R may also be used to augment the qualitative assessment of the responsible engineer.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** The acceptance standards for the unbonded post-tensioning system are quantitative in nature. For the post tensioning system, quantitative acceptance criteria are given for tendon force and elongation, tendon wire or strand samples, and corrosion protection medium. • 10 CFR 50.55a and Subsection IWL do not define the method for calculating predicted tendon prestressing forces for comparison to the measured tendon lift-off forces. • The predicted tendon forces are to be calculated in accordance with Regulatory Guide 1.35.1, which provides an acceptable methodology for use through the period of extended operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** ASME Section XI, Subsection IWL was incorporated into 10 CFR 50.55a in 1996. Prior to this time, operating experience pertaining to degradation of reinforced concrete and prestressing systems in concrete containments was gained through the inspections required by 10 CFR Part 50, Appendix J and ad hoc inspections conducted by licensees and the Nuclear Regulatory Commission (NRC). Recently, NRC Information Notice (IN) 99-10 described occurrences of degradation in prestressing systems. The program is to consider the degradation concerns described in this generic communication. Implementation of Subsection IWL, in accordance with 10 CFR 50.55a, is a necessary element of aging management for concrete containments through the period of extended operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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ENHANCEMENTS

Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.8 Containment Leakage Testing Program

This AMP requires auditing against the following GALL AMP:

XI.S4 10 CFR Part 50, Appendix J

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.8 Containment Leakage Testing Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.S4 10 CFR Part 50, Appendix J

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** As described in 10 CFR Part 50, Appendix J, containment leak rate tests are required "to assure that (a) leakage through the primary reactor containment and systems and components penetrating primary containment shall not exceed allowable leakage rate values as specified in the technical specifications or associated bases and (b) periodic surveillance of reactor containment penetrations and isolation valves is performed so that proper maintenance and repairs are made during the service life of the containment, and systems and components penetrating primary containment. "Appendix J provides two options, A and B, either of which can be chosen to meet the requirements of a containment LRT program. Under Option A, all of the testing must be performed on a periodic interval. Option B is a performance-based approach. Some of the differences between these options are discussed below, and more detailed information for Option B is provided in the Nuclear Regulatory Commission (NRC) Regulatory Guide (RG) 1.163 and NEI 94-01, Rev. 0.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
1. Scope of Program	**A** The scope of the containment LRT program includes all pressure-retaining components.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** Type A and B tests described in 10 CFR Part 50, Appendix J, are acceptable methods for performing these LRTs.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**C** Leakage testing for containment isolation valves (normally performed under Type C tests), if not included under this program, is included under LRT programs for systems containing the isolation valves.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
2. Preventive Actions:	**A** No preventive actions are specified; the containment LRT program is a monitoring program.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** The parameters to be monitored are leakage rates through containment shells; containment liners; and associated welds, penetrations, fittings, and other access openings.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
4. Detection of Aging Effects:	**A** A containment LRT program is effective in detecting degradation of containment shells, liners, and components that compromise the containment pressure boundary, including seals and gaskets. While the calculation of leakage rates demonstrates the leak-tightness and structural integrity of the containment, it does not by itself provide information that would indicate that aging degradation has initiated or that the capacity of the containment may have been reduced for other types of loads, such as seismic loading. This would be achieved with the additional implementation of an acceptable containment inservice inspection program as described in XI.S1 and XI.S2.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** With Option A, testing is performed on a regular fixed time interval as defined in 10 CFR Part 50, Appendix J.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** In the case of Option B, the interval for testing may be increased on the basis of acceptable performance in meeting leakage limits in prior tests. Additional details for implementing Option B are provided in NRC Regulatory Guide 1.163 and NEI 94-01, Rev.0.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** Acceptance criteria for leakage rates are defined in plant technical specifications.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** These acceptance criteria meet the requirements in 10 CFR Part 50, Appendix J, and are part of each plant's current licensing basis.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** To date, the 10 CFR Part 50, Appendix J, LRT program has been effective in preventing unacceptable leakage through the containment pressure boundary. Implementation of Option B for testing frequency must be consistent with plant-specific operating experience.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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ENHANCEMENTS

Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.9 Diesel Fuel Monitoring and Storage Program

This AMP requires auditing against the following GALL AMP:

XI.M30 Fuel Oil Chemistry

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.9 Diesel Fuel Monitoring and Storage Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.M30 Fuel Oil Chemistry

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The program includes (a) surveillance and maintenance procedures to mitigate corrosion and (b) measures to verify the effectiveness of an aging management program (AMP) and confirm the absence of an aging affect.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Fuel oil quality is maintained by monitoring and controlling fuel oil contamination in accordance with the guidelines of the American Society for Testing Materials (ASTM) Standards D 1796, D2276, D2709, and D4057.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Exposure to fuel oil contaminants, such as water and microbiological organisms, is minimized by periodic draining or cleaning of tanks and by verifying the quality of new oil before its introduction into the storage tanks.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**D** The effectiveness of the program is verified to ensure that significant degradation is not occurring and the component intended function will be maintained during the extended period of operation. Thickness measurement of tank bottom surfaces is an acceptable verification program.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
1. Scope of Program	**A** The program is focused on managing the conditions that cause general, pitting, and microbiologically influence corrosion (MIC) of the diesel fuel tank internal surfaces. The program serves to reduce the potential of exposure of the tank internal surface to fuel oil contaminated with water and microbiological organisms.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
2. Preventive Actions:	**A** The quality of fuel oil is maintained by additions of biocides to minimize biological activity, stabilizers to prevent biological breakdown of the diesel fuel, and corrosion inhibitors to mitigate corrosion. One-time inspection is an inspection activity independent of methods to mitigate or prevent degradation.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Periodic cleaning of a tank allows removal of sediments.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Periodic draining of water collected at the bottom of a tank minimizes the amount of water and the length of contact time.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
3. Parameters Monitored/Inspected:	**A** The AMP monitors fuel oil quality and the levels of water and microbiological organisms in the fuel oil.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The ASTM Standard D 4057 is used for guidance on oil sampling.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** The ASTM Standards D 1796 and D 2709 are used for determination of water and sediment contamination in diesel fuel.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**D** For determination of particulates, modified ASTM D 2276, Method A, is used.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** Internal surfaces of tanks that are drained for cleaning are visually inspected to detect potential degradation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** However, corrosion may occur at locations in which contaminants may accumulate, such as a tank bottom, and an ultrasonic thickness measurement of the tank bottom surface ensures that significant degradation is not occurring.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** Water and biological activity or particulate contamination concentrations are monitored and trended at least quarterly. Based on industry operating experience, quarterly sampling and analysis of fuel oil provide for timely detection of conditions conducive to corrosion of the internal surface of the diesel fuel oil tank before the potential loss of its intended function.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** The ASTM Standard D 4057 is used for guidance on oil sampling.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The ASTM Standards D 1796 and D 2079 are used for guidance on the determination of water and sediment contamination in diesel fuel.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Modified ASTM D 2276, Method A is used for determination of particulates. The modification consists of using a filter with a pore size of 3.0 μm, instead of 0.8 μm.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** The operating experience at some plants has included identification of water in the fuel, particulate contamination, and biological fouling. However, no instances of fuel oil system component failures attributed to contamination have been identified.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.10 Fire Protection Program

This AMP requires auditing against the following two (2) GALL AMPs:

XI.M26 Fire Protection
XI.M27 Fire Water System

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.10 Fire Protection Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.M26 Fire Protection

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** For operating plants, the fire protection aging management program (AMP) includes a fire barrier inspection program and a diesel-driven fire pump inspection program. The fire barrier inspection program requires periodic visual inspection of fire barrier penetration seals, fire barrier walls, ceilings, and floors, and periodic visual inspection and functional tests of fire rated doors to ensure that their operability is maintained. The diesel-driven fire pump inspection program requires that the pump be periodically tested to ensure that the fuel supply line can perform the intended function. The AMP also includes periodic inspection and test of halon/carbon dioxide fire suppression system.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
1. Scope of Program	**A** the AMP manages the aging effects on the intended function of the penetration seals, fire barrier walls, ceilings, and floors, and all fire rated doors (automatic or manual) that perform a fire barrier function. It also manages the aging effects on the intended function of the fuel supply line. The AMP also includes management of the aging effects on the intended function of the halon/carbon dioxide fire suppression system.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
2. Preventive Actions:	**A** the fire hazard analysis assesses the fire potential and fire hazard in all plant areas.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** It also specifies measures for fire prevention, fire detection, fire suppression, and fire containment and alternative shutdown capability for each fire area containing structures, systems, and components important to safety.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** Visual inspection of 10% of each type of penetration seal is performed during walkdowns carried out at least once every refueling outage.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** These inspections examine any sign of degradation such as cracking, seal separation from walls and components, separation of layers of material, rupture and puncture of seals which are directly caused by increased hardness and shrinkage of seal material due to weathering. Visual inspection of the fire barrier walls, ceilings, and floors examines any sign of degradation such as cracking, spalling, and loss of material caused by freeze-thaw, chemical attack, and reaction with aggregates.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** Hollow metal fire doors are visually inspected at least once bi-monthly for holes in the skin of the door.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**D** Fire door clearances are also checked at least once bi-monthly as part of an inspection program.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**E** Function tests of fire doors are performed daily, weekly, or monthly (which maybe plant specific) to verify the operability of automatic hold-open, release, closing mechanisms, and latches.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**F** The diesel-driven fire pump is under observation during performance tests such as flow and discharge tests, sequential starting capability tests, and controller function tests for detecting any degradation of the fuel supply line.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**G** Periodic visual inspection and function test at least once every six months examines the signs of degradation of the halon/carbon dioxide fire suppression system. The suppression agent charge pressure is monitored in the test. Material conditions that may affect the performance of the system, such as corrosion, mechanical damage, or damage to dampers, are observed during these tests. H Inspections performed at least once every month verify that the extinguishing agent supply valves are open and the system in automatic mode.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**H** Inspections performed at least once every month verify that the extinguishing agent supply valves are open and the system in automatic mode.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** If any sign of degradation is detected within that 10%, the scope of the inspection and frequency is expanded to ensure timely detection of increased hardness and shrinkage of the penetration seal before the loss of the component intended function.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Inspection (VT-1 or equivalent) of the fire barrier walls, ceilings, and floors performed in walkdown at least once every refueling outage ensures timely detection for concrete cracking, spalling, and loss of material.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** Visual inspection (VT-3 or equivalent) detects any sign of degradation of the fire door such as wear and missing parts.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**D** Function tests promptly detect deficiencies in operational conditions.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**E** Periodic tests performed at least once every refueling outage, such as flow and discharge tests, sequential starting capability tests, and controller function tests performed on diesel-driven fire pump ensure fuel supply line performance.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**F** The performance tests detect degradation of the fuel supply lines before the loss of the component intended function.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**G** In the test of the halon/carbon dioxide fire suppression system, the suppression agent charge pressure is verified to be within in the normal band.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** The aging effects of weathering on fire barrier penetration seals are detectable by visual inspection and, based on operating experience, visual inspections performed at least once every refueling outage to detect any sign of degradation of fire barrier penetration seals prior to loss of the intended function.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Concrete cracking, spalling, and loss of material are detectable by visual inspection and, based on operating experience, visual inspection performed at least once every refueling outage detects any sign of degradation of the fire barrier walls, ceilings, and floors before there is a loss of the intended function.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Wear, missing parts, or holes in the fire door are detectable by visual inspection and, based on operating experience, the visual inspection and function test performed bi-monthly which detects degradation of the fire doors prior to loss of the intended function.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**D** The performance of the fire pump is monitored during the periodic test to detect any degradation in the fuel supply lines. Periodic testing provides data (e.g., pressure) for trending necessary.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**E** The performance of the halon/carbon dioxide fire suppression system is monitored during the periodic test to detect any degradation in the system. These periodic tests provide data necessary for trending.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** Inspection results are acceptable if there are no visual Indications of cracking, separation of seals from walls and components, separation of layers of material, or ruptures or punctures of seals, no visual indications of concrete cracking, spalling and loss of material of fire barrier walls, ceilings, and floors, no visual indications of missing parts, holes, and wear and no deficiencies in the functional tests of fire doors.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** No corrosion is acceptable in the fuel supply line for diesel-driven fire pump.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** any signs of corrosion and mechanical damage of the halon/carbon dioxide fire suppression system are not acceptable.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** Silicone foam fire barrier penetration seals have experienced splits, shrinkage, voids, lack of fill, and other failure modes (IN 88-56, IN 94-28, and IN 97-70). Degradation of electrical racing way fire barrier such as small holes, cracking, and unfilled seals are found on routine walkdown (IN 91-47 and GL 92-08). Fire doors have experienced wear of the hinges and handles. Operating experience with the use of this AMP has shown that no corrosion-related problem has been reported for the fuel supply line, pump casing of the diesel-driven fire pump, and the halon/carbon dioxide suppression system.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.10 Fire Protection Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.M27 Water System

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The aging management program applies to water-based fire protection systems that consist of sprinklers, nozzles, fittings, valves, hydrants, hose stations, standpipes, water storage tanks, and aboveground and underground piping and components that are tested in accordance with the applicable National Fire Protection Association (NFPA) codes and standards. In addition to NFPA codes and standards, which do not currently contain programs to manage aging, portions of the fire protection sprinkler system, which are not routinely subjected to flow, are to be subjected to full flow tests at the maximum design flow and pressure before the period of extended operation (and at not more than 5-year intervals thereafter). In addition, a sample of sprinkler heads is to be inspected by using the guidance of NFPA 25, Section 2.3.3.1. This NFPA section states that "where sprinklers have been in place for 50 years, they shall be replaced or representative samples from one or more sample areas shall be submitted to a recognized testing laboratory for field service testing." It also contains guidance to perform this sampling every 10 years after the initial field service testing. Finally, portions of fire protection suppression piping located aboveground and exposed to water are disassembled and visually inspected internally once every refueling outage. The purpose of the full flow testing and internal visual inspections is to ensure that corrosion, microbiological influenced corrosion (MIC), or biofouling aging effects are managed such that the system function is maintained.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
1. Scope of Program	**A** The aging management program focuses on managing loss of material due to corrosion, MIC, or biofouling of carbon steel and cast-iron components in fire protection systems exposed to water.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**B** Hose station and standpipe are considered as piping in the AMP.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
2. Preventive Actions:	**A** To ensure no significant corrosion, MIC, or biofouling has occurred in water-based fire protection systems, periodic flushing, system performance testing, and inspections are conducted.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** The parameters monitored are the system's ability to maintain pressure and internal system corrosion conditions.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
4. Detection of Aging Effects:	**A** Fire protection system testing is performed to assure required pressures.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Internal inspections of aboveground fire protection piping and the smaller diameter fire suppression piping are performed on system components (when they are due to corrosion.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Repair and replacement actions are initiated as necessary.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**D** general requirements of existing fire protection programs include testing and maintenance of fire detection and suppression systems and surveillance procedures to ensure that fire detectors, as well as fire suppression systems and components, are operable.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**E** Visual inspection of yard fire hydrants performed once every six months ensures timely detection of signs of degradation, such as corrosion.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**F** Fire hydrant hose hydrostatic tests, gasket inspections, and fire hydrant flow tests, performed annually, ensure that fire hydrants can perform their intended function and provide of intended function can occur.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**G** Sprinkler systems are inspected once every refueling outage to ensure that signs of degradation, such as corrosion, are detected in a timely manner.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** System discharge pressure is monitored continuously.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
“	**B** Results of system performance testing are monitored and trended as specified by the NFPA codes and standards.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
“	**C** Degradation identified by internal inspection is evaluated.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** The acceptance criteria are the ability of a fire protection system to maintain required pressure, no unacceptable signs of degradation observed during visual assessment of internal system conditions, and that no biofouling exists in the sprinkler systems that could cause corrosion in the sprinkler heads.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** Water-based fire protection systems designed, inspected, tested and maintained in accordance with the NFPA minimum standards have demonstrated reliable performance.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.11 Flow Accelerated Corrosion Program

This AMP requires auditing against the following GALL AMP:

XI.M17 Flow-Accelerated Corrosion

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.11 Flow Accelerated Corrosion Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.M17 Flow-Accelerated Corrosion

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The program relies on implementation of the Electric Power Research Institute (EPRI) guidelines in the Nuclear Safety Analysis Center (NSAC)-202L-R2 for an effective flow-accelerated corrosion (FAC) program. The program includes performing (a) an analysis to determine critical locations, (b) limited baseline inspections to determine the extent of thinning at these locations, and (c) follow-up inspections to confirm the predictions, or repairing or replacing components as necessary.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
1. Scope of Program	**A** The FAC program, described by the EPRI guidelines in NSAC-202L-R2, includes procedures or administrative controls to assure that the structural integrity of all carbon steel lines containing high-energy fluids (two phase as well as single phase) is maintained.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment
"	**B** Valve bodies retaining pressure in these high-energy systems are also covered by the program.	

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** A program implemented in accordance with the EPRI guidelines predicts, detects, and monitors FAC in plant piping and other components, such as valve bodies, elbows and expanders. Such a program includes the following recommendations: (a) conducting an analysis to determine critical locations; (b) performing limited baseline inspections to determine the extent of thinning at these locations; and (c) performing follow-up inspections to confirm the predictions, or repairing or replacing components as necessary.	
2. Preventive Actions:	**A** The FAC program is an analysis, inspection, and verification program; thus, there is no preventive action.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** The aging management program (AMP) monitors the effects of FAC on the intended function of piping and components by measuring wall thickness.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** Degradation of piping and components occurs by wall thinning. The inspection program delineated in NSAC-202L consists of identification of susceptible locations as indicated by operating conditions or special considerations.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Ultrasonic and radiographic testing is used to detect wall thinning. The extent and schedule of the inspections assure detection of wall thinning before the loss of intended function.	

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
5. Monitoring and Trending:	**A** CHECWORKS or a similar predictive code is used to predict component degradation in the systems conducive to FAC, as indicated by specific plant data, including material, hydrodynamic, and operating conditions.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The inspection schedule developed by the licensee on the basis of the results of such a predictive code provides reasonable assurance that structural integrity will be maintained between inspections.	
"	**C** If degradation is detected such that the wall thickness is less than the minimum predicted thickness, additional examinations are performed in adjacent areas to bound the thinning.	
6. Acceptance Criteria:	**A** Inspection results are used as input to a predictive computer code, such as CHECWORKS, to calculate the number of refueling or operating cycles remaining before the component reaches the minimum allowable wall thickness.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** If calculations indicate that an area will reach the minimum allowed thickness before the next scheduled outage, the component is to be repaired, replaced, or reevaluated.	
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
10. Operating Experience:	**A** Wall-thinning problems in single-phase systems have occurred in feedwater and condensate systems (NRC IE Bulletin No. 87-01; NRC Information Notices [INs] 81-28, 92-35, 95-11) and in two-phase piping in extraction steam lines (NRC INs 89-53, 97-84) and moisture separation reheater and feedwater heater drains (NRC INs 89-53, 91-18, 93-21, 97-84). Operating experience shows that the present program, when properly implemented, is effective in managing FAC in high-energy carbon steel piping and components.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program

This AMP requires auditing against the following three (3) GALL AMPs:

XI.E1 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements
XI.E2 Electrical Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits
XI.E3 Inaccessible Medium-Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements **[Assigned to DE. Worksheet not included.]**

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program

REVIEWER: _____

DATE: _____

GALL AMP: XI.E1 Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The purpose of the aging management program described herein is to provide reasonable assurance that the intended functions of electrical cables and connections that are not subject to the environmental qualification requirements of 10 CFR 50.49 and are exposed to adverse localized environments caused by heat, radiation, or moisture will be maintained consistent with the current licensing basis through the period of extended operation. This program considers the technical information and guidance provided in NUREG/CR-5643, IEEE Std. P1205, SAND96-0344, and EPRI TR-109619.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The program described herein is written specifically to address cables and connections at plants whose configuration is such that most (if not all) cables and connections installed in adverse localized environments are accessible.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** Since they are not subject to the environmental qualification requirements of 10 CFR 50.49, the electrical cables and connections covered by this aging management program are either not exposed to harsh accident conditions or are not required to remain functional during or following an accident to which they are exposed.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
1. Scope of Program	**A** This inspection program applies to accessible electrical cables and connections within the scope of license renewal that are installed in adverse localized environments caused by heat or radiation in the presence of oxygen	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
2. Preventive Actions:	**A** This is an inspection program and no actions are taken as part of this program to prevent or mitigate aging degradation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** A representative sample of accessible electrical cables and connections installed in adverse localized environments are visually inspected for cable and connection jacket surface anomalies, such as embrittlement, discoloration, cracking, or surface contamination. The technical basis for the sample selected is to be provided.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** Accessible electrical cables and connections installed in adverse localized environments are visually inspected at least once every 10 years.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** The first inspection for license renewal is to be completed before the period of extended operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** Trending actions are not included as part of this program because the ability to trend inspection results is limited.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** the accessible cables and connections are to be free from unacceptable, visual indications of surface anomalies, which suggest that conductor insulation or connection degradation exists. An unacceptable indication is defined as a noted condition or situation that, if left unmanaged, could lead to a loss of the intended function.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
10. Operating Experience:	**A** Operating experience has shown that adverse localized environments caused by heat or radiation for electrical cables and connections may exist next to or above (within three feet of) steam generators, pressurizers or hot process pipes, such as feedwater lines. These adverse localized environments have been found to cause degradation of the insulating materials on electrical cables and connections that is visually observable, such as color changes or surface cracking. These visual indications can be used as indicators of degradation.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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ENHANCEMENTS

Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
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AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.12 Non-EQ Electrical Commodities Condition Monitoring Program

REVIEWER: _____

DATE: _____

GALL AMP: XI.E2 Electrical Cables And Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used In Instrumentation Circuits

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The purpose the aging management program described herein is to provide reasonable assurance that the intended functions of electrical cables that are not subject to the environmental qualification requirements of 10 CFR 50.49 and are used in circuits with sensitive, low-level signals exposed to adverse localized environments caused by heat, radiation or moisture will be maintained consistent with the current licensing basis through the period of extended operation. This program considers the technical information and guidance provided in NUREG/CR-5643, IEEE Std. P1205, SAND96-0344, and EPRI TR-109619. In this aging management program, routine calibration tests performed as part of the plant surveillance test program are used to identify the potential existence of aging degradation When an instrumentation loop is found to be out of calibration during routine surveillance testing, trouble shooting is performed on the loop, including the instrumentation cable.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** Since they are not subject to the environmental qualification requirements of 10 CFR 50.49, the electrical cables covered by this aging management program are either not exposed to harsh accident conditions or are not required to remain functional during or following an accident to which they are exposed.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
1. Scope of Program	**A** This program applies to electrical cables used in circuits with sensitive, low-level signals such as radiation monitoring and nuclear instrumentation that are within the scope of license renewal.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
2. Preventive Actions:	**A** This is a surveillance testing program and no actions are taken as part of this program to prevent or mitigate aging degradation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** The parameters monitored are determined from the plant technical specifications and are specific to the instrumentation loop being calibrated, as documented in the surveillance test procedure.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** Calibration provides sufficient indication of the need for corrective actions by monitoring key parameters and providing trending data based on acceptance criteria related to instrumentation loop performance.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** The normal calibration frequency specified in the plant technical specifications provides reasonable assurance that severe aging degradation will be detected prior to loss of the cable intended function. The first tests for license renewal are to be completed before the period of extended operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** Trending actions are not included as part of this program because the ability to trend test results is dependent on the specific type of test chosen.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** Calibration readings are to be within the loop-specific acceptance criteria, as set out in the plant technical specifications surveillance test procedures.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** Operating experience has shown that a significant number of cable failures are identified through routine calibration testing. Changes in instrument calibration can be caused by degradation of the circuit cable and are one indication of potential electrical cable degradation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.13 One-Time Inspection Program

This AMP requires auditing against the following three (3) GALL AMPs:

XI.M29 Aboveground Carbon Steel Tanks
XI.M32 One-Time Inspection
XI.M33 Selective Leaching Of Materials

Audit Worksheet
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.13 One-Time Inspection Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.M29 Aboveground Carbon Steel Tanks

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The program includes preventive measures to mitigate corrosion by protecting the external surface of carbon steel tanks with paint or coatings in accordance with standard industry practice. The program also relies on periodic system walkdowns to monitor degradation of the protective paint or coating.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** for storage tanks supported on earthen or concrete foundations, corrosion may occur at inaccessible locations, such as the tank bottom. Accordingly, verification of the effectiveness of the program is to be performed to ensure that significant degradation in inaccessible locations is not occurring and the component intended function will be maintained during the extended period of operation. For reasons set forth below, an acceptable verification program consists of thickness measurement of the tank bottom surface.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
1. Scope of Program	**A** The program consists of preventive measures to mitigate corrosion by protecting the external surfaces of carbon steel tanks protected with paint or coatings and periodic system walkdowns to manage the effects of corrosion on the intended function of these tanks. Plant walkdowns cover the entire outer surface of the tank up to its surface in contact with soil or concrete.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
2. Preventive Actions:	**A** In accordance with industry practice, tanks are coated with protective paint or coating to mitigate corrosion by protecting the external surface of the tank from environmental exposure.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Sealant or caulking at the interface edge between the tank and concrete or earthen foundation mitigates corrosion of the bottom surface of the tank by preventing water and moisture from penetrating the interface, which would lead to corrosion of the bottom surface.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** The aging management program (AMP)utilizes periodic plant system walkdowns to monitor degradation because it is a condition directly related to the potential loss of materials.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** Periodic system walkdowns to confirm that the paint, coating, sealant, and caulking are intact is an effective method to manage the effects of corrosion on the external surface of the component.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** corrosion may occur at inaccessible locations, such as the tank bottom surface, and thickness measurement of the tank bottom is to be taken to ensure that significant degradation is not occurring and the component intended function will be maintained during the extended period of operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** The effects of corrosion of the aboveground external surface are detectable by visual techniques. Based on operating experience, plant system walkdowns during each outage provide for timely detection of aging effects.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The effects of corrosion of the underground external surface are detectable by thickness measurement of the tank bottom and are monitored and trended if significant material loss is detected.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** Any degradation of paint, coating, sealant, and caulking is reported and will require further evaluation. Degradation consists of cracking, flaking, or peeling of paint or coatings, and drying, cracking or missing sealant and caulking.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** Thickness measurements of the tank bottom are evaluated against the design thickness and corrosion allowance.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** Coating degradation has occurred in safety-related systems and structures (Nuclear Regulatory Commission [NRC]Generic Letter [GL] 98-04). Corrosion damage near the concrete-metal interface and sand-metal interface has been reported in metal containments (NRC Information Notice [IN] 89-79, Supplement 1, and NRC IN 86-99, Supplement 1).	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.13 One-Time Inspection Program

REVIEWER: _____

DATE: _____

GALL AMP: XI.M32 One-Time Inspection

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The program includes measures to verify the effectiveness of an aging management program (AMP) and confirm the absence of an aging effect. There are cases where either (a) an aging effect is not expected to occur but there is insufficient data to completely rule it out, or (b) an aging effect is expected to progress very slowly. The elements of the program include (a) determination of the sample size based on an assessment of materials of fabrication, environment, plausible aging effects, and operating experience; (b) identification of the inspection locations in the system or component based on the aging effect; (c) determination of the examination technique, including acceptance criteria that would be effective in managing the aging effect for which the component is examined; and (d) evaluation of the need for follow-up examinations to monitor the progression of any aging degradation. When evidence of an aging effect is revealed by a one-time inspection, the routine evaluation of the inspection results would identify appropriate corrective actions. An acceptable verification program may consist of a one-time inspection of selected components and susceptible locations in the system.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
	An alternative acceptable program may include routine maintenance or a review of repair records to confirm that these components have been inspected for aging degradation and significant aging degradation has not occurred and thereby verify the effectiveness of existing AMPs.	
1. Scope of Program	**A** The program includes measures to verify that unacceptable degradation is not occurring, thereby validating the effectiveness of existing AMPs or confirming that there is no need to manage aging-related degradation for the period of extended operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The structures and components for which one-time inspection is to verify the effectiveness of the AMPs (e.g., water chemistry control, etc.) have been identified in the Generic Aging Lessons Learned (GALL) Report.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
2. Preventive Actions:	**A** One-time inspection is an inspection activity independent of methods to mitigate or prevent degradation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** The program monitors parameters directly related to the degradation of a component.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** Inspection is performed in accordance with the requirements of the American Society of Mechanical Engineers (ASME) Code and 10 CFR 50, Appendix B, by using a variety of nondestructive examination (NDE) methods, including visual, volumetric, and surface techniques.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** The inspection includes a representative sample of the system population, and, where practical, focus on the bounding or lead components most susceptible to aging due to time in service, severity of operating conditions, and lowest design margin.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** For small-bore piping, actual inspection locations are based on physical accessibility, exposure levels, NDE techniques, and locations identified in Nuclear Regulatory Commission (NRC) Information Notice (IN) 97-46.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Combinations of NDE, including visual, ultrasonic, and surface techniques, are performed by qualified personnel following procedures consistent with the ASME Code and 10 CFR 50, Appendix B.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**D** For small-bore piping less than NPS 4 in., including pipe, fittings, and branch connections, a plant-specific destructive examination of replaced piping due to plant modifications or NDE that permits inspection of the inside surfaces of the piping is to be conducted to ensure that cracking has not occurred.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**E** Follow-up of unacceptable inspection findings includes expansion of the inspection sample size and locations.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**F** With respect to inspection timing, the one-time inspection is to be completed before the end of the current operating license.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**G** the inspection is not to be scheduled too early in the current operating term, which could raise questions regarding continued absence of aging effects prior to and near the extended period of operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** One-time inspection does not provide specific guidance on monitoring and trending.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** evaluation of the appropriateness of the techniques and timing of the one-time inspection improve with the accumulation of plant-specific and industry-wide experience.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
6. Acceptance Criteria:	**A** Any indication or relevant conditions of degradation detected are evaluated.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The ultrasonic thickness measurements are to be compared to predetermined limits, such as design minimum wall thickness.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** The elements that comprise these inspections (e.g., the scope of the inspections and inspection techniques) are consistent with years of industry practice and staff expectations.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
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AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.13 One-Time Inspection Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.M33 Selective Leaching Of Materials

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The program for selective leaching of materials ensures the integrity of the components made of cast iron, bronze, brass, and other alloys exposed to a raw water, brackish water, treated water, or groundwater environment that may lead to selective leaching of one of the metal components.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The aging management program (AMP) a one-time visual inspection and hardness measurement of selected components that may be susceptible to selective leaching to determine whether loss of materials due to selective leaching is occurring, and whether the process will affect the ability of the components to perform their intended function for the period of extended operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
1. Scope of Program	**A** This AMP determines the acceptability of the components that may be susceptible to selective leaching and assess their ability to perform the intended function during the period of extended operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** These components include piping, valve bodies, and bonnets, pump casing, and heat exchanger components.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**C** The materials of construction for these components may include cast iron, brass, bronze, or aluminum-bronze.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**D** These components may be exposed to a raw water, treated water, or groundwater environment.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**E** The AMP includes a one-time hardness measurement of a selected set of components to determine whether loss of material due to selective leaching is not occurring for the period of extended operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
2. Preventive Actions:	**A** The one-time visual inspection and hardness measurement is an inspection/verification program; thus, there is no preventive action.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** The visual inspection and hardness measurement is to be a one-time inspection.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Because selective leaching is a slow acting corrosion process, this measurement is performed just before the beginning of the license renewal period. Follow-up of unacceptable inspection findings includes expansion of the inspection sample size and location.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** The one-time visual inspection and hardness measurement includes close examination of a select set of components to determine whether selective leaching has occurred and whether the resulting loss of strength and/or material will affect the intended functions of these components during the period of extended operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** One acceptable procedure is to visually inspect the susceptible components closely and conduct Brinell Hardness testing on the inside surfaces of the selected set of components to determine if selective leaching has occurred.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** If it is occurring, an engineering evaluation is initiated to determine acceptability of the affected components for further service.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** There is no monitoring and trending inspection and hardness measurement.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** Identification of selective leaching will define the need for further engineering evaluation before the affected components can be qualified for further service. If necessary, the evaluation will include a root cause analysis.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
10. Operating Experience:	**A** One-time inspection is a new program to be applied by the applicant. The elements that comprise these inspections (e.g., the scope of the inspections and inspection techniques) are consistent with years of industry practice and staff expectations.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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ENHANCEMENTS

Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.14 Open Cycle Cooling Water Program

This AMP requires auditing against the following GALL AMP:

XI.M20 Open-Cycle Cooling Water System

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.14 Open Cycle Cooling Water Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.M20 Open-Cycle Cooling Water System

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The program relies on implementation of the recommendations of the Nuclear Regulatory Commission (NRC) Generic Letter (GL) 89-13 to ensure that the effects of aging on the open-cycle cooling water (OCCW) (or service water) system will be managed for the extended period of operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The program includes surveillance and control techniques to manage aging effects caused by biofouling, corrosion, erosion, protective coating failures, and silting in the OCCW system or structures and components serviced by the OCCW system.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
1. Scope of Program	**A** The program addresses the aging effects of material loss and fouling due to micro- or macro-organisms and various corrosion mechanisms.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** Because the characteristics of the service water system may be specific to each facility, the OCCW system is defined as a system or systems that transfer heat from safety-related systems, structures, and components (SSC) to the ultimate heat sink (UHS). If an intermediate system is used between the safety-related SSCs and the system rejecting heat to the UHS, that intermediate system performs the function of a service water system and is thus included in the scope of recommendations of NRC GL 89-13.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** The guidelines of NRC GL 89-13 include (a) surveillance and control of biofouling;(b) a test program to verify heat transfer capabilities; (c) routine inspection and a maintenance program to ensure that corrosion, erosion, protective coating failure, silting, and biofouling cannot degrade the performance of safety-related systems serviced by OCCW; (d) a system walkdown inspection to ensure compliance with the licensing basis; and (e) a review of maintenance, operating, and training practices and procedures.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
2. Preventive Actions:	**A** Implementation of NRC GL 89-13 includes a condition and performance monitoring program; control or preventive measures, such as chemical treatment, whenever the potential for biological fouling species exists; or flushing of infrequently used systems.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** Cleanliness and material integrity of piping, components, heat exchangers, and their internal linings or coatings (when applicable) that are part of the OCCW system or that are cooled by the OCCW system are periodically inspected, monitored, or tested to ensure heat transfer capabilities.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** The program ensures (a) removal of accumulations of biofouling agents, corrosion products, and silt, and (b) detection of defective protective coatings and corroded OCCW system piping and components that could adversely affect performance of their intended safety functions.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** Inspections for biofouling, damaged coatings, and degraded material condition are conducted. Visual inspections are typically performed; however, nondestructive testing, such as ultrasonic testing, eddy current testing, and heat transfer capability testing, are effective methods to measure surface condition and the extent of wall thinning associated with the service water system piping and components, when determined necessary.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** Inspection scope, method (e.g., visual or nondestructive examination [NDE]), and testing frequencies are in accordance with the utility commitments under NRC GL 89-13.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Testing and inspections are done annually and during refueling outages.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** Inspections or nondestructive testing will determine the extent of biofouling, the condition of the surface coating, the magnitude of localized pitting, and the amount of MIC, if applicable.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**D** Heat transfer testing results are documented in plant test procedures and are trended and reviewed by the appropriate group.	**(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** Biofouling is removed or reduced as part of the surveillance and control process.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Acceptance criteria are based on effective cleaning of biological fouling organisms and maintenance of protective coating or linings are emphasized.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
10. Operating Experience:	**A** Significant microbiologically influenced corrosion (NRC Information Notice [IN] 85-30), failure of protective coatings (NRC IN 85-24), and fouling (NRC IN 81-21, IN 86-96) have been observed in a number of heat exchangers. The guidance of NRC GL 89-13 has been implemented for approximately 10 years and has been effective in managing aging effects due to biofouling, corrosion, erosion, protective coating failures, and sitting in structures and components serviced by OCCW systems.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

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Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.15 Overhead Load Handling Systems Inspection Program

This AMP requires auditing against the following GALL AMP:

XI.M23 Inspection Of Overhead Heavy Load And Light Load (Related To Refueling) Handling Systems

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.15 Overhead Load Handling Systems Inspection Program

REVIEWER: _____

DATE: _____

GALL AMP: XI.M23 Inspection Of Overhead Heavy Load And Light Load (Related To Refueling) Handling Systems

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The program demonstrates that testing and monitoring programs have been implemented and have ensured that the structures, systems, and components of these cranes are capable of sustaining their rated loads. This is their intended function during the period of extended operation. It is noted that many of the systems and components of these cranes perform an intended function with moving parts or with a change in configuration, or subject to replacement based on qualified life. In these instances, these types of crane systems and components are not within the scope of this aging management program (AMP). • This program is primarily concerned with structural components that make up the bridge and trolley. • NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," provides specific guidance on the control of overhead heavy load cranes.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
1. Scope of Program	**A** The program manages the effects of general corrosion on the crane and trolley structural components for those cranes that are within the scope of 10 CFR 54.4, and the effects of wear on the rails in the rail system.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
2. Preventive Actions:	**A** No preventive actions are identified. The crane program is an inspection program.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** The program evaluates the effectiveness of the maintenance monitoring program and the effects of past and future usage on the structural reliability of cranes.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The number and magnitude of lifts made by the crane are also reviewed.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
4. Detection of Aging Effects:	**A** Crane rails and structural components are visually inspected on a routine basis for degradation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Functional tests are also performed to assure their integrity.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** Monitoring and trending are not required as part of the crane inspection program.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** Any significant visual indication of loss of material due to corrosion or wear are evaluated according to applicable industry standards and good industry practice.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** The crane may also have been designed to a specific Service Class as defined in the EOCI Specification #61 (or later revisions), or CMAA Specification #70 (or later revisions), or CMAA Specification #74 (or later revisions). The specification that was applicable at the time the crane was manufactured is used.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** Because of the requirements for monitoring the effectiveness of maintenance at nuclear power plants provided in 10 CFR 50.65, there has been no history of corrosion-related degradation that has impaired cranes. Likewise, because cranes have not been operated beyond their design lifetime, there have been no significant fatigue-related structural failures.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.17 Reactor Vessel Internals Inspection Program

This AMP should be discussed with the Project Team Leader to obtain guidance on how to proceed.

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.17 Reactor Vessel Internals Inspection Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.M16 PWR Vessel Internals

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description		**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
1. Scope of Program		**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment
2. Preventive Actions:		**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
3. Parameters Monitored/Inspected:		**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:		**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:		**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:		**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*		N/A
8. Confirmation Process:		N/A
9. Administrative Controls:		N/A
10. Operating Experience:		**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.18 Steam Generator Tube Integrity Program

This AMP requires auditing against the following GALL AMP:

XI.M19 Steam Generator Tube Integrity

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.18 Steam Generator Tube Integrity Program

REVIEWER: _____

DATE: _____

GALL AMP: XI.M19 Steam Generator Tube Integrity

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** Nondestructive examination (NDE) techniques are used to identify tubes that are defective and need to be removed from service or repaired in accordance with the guidelines of the plant technical specifications. • In addition, operational leakage limits are included to ensure that, should substantial tube leakage develop, prompt action is taken to avoid rupture of the leaking tubes. • These limits are included in plant technical specifications, such as standard technical specifications of NUREG-1430, Rev. 1, for Babcock & Wilcox pressurized water reactors (PWRs); NUREG-1431, Rev. 1, for Westinghouse PWRs; and NUREG-1432, Rev. 1, for Combustion Engineering PWRs.	**Consistent with GALL AMP:** ☐ Yes ☐ No **Document(s) used to confirm Criteria:** Comment:
"	**B** The technical specifications specify SG inspection scope and frequency, and acceptance criteria for the plugging and repair of flawed tubes. • The Nuclear Regulatory Commission (NRC) Regulatory Guide (RG) 1.121, "Bases for Plugging Degraded Steam Generator Tubes," provides guidelines for determining the tube repair criteria and operational leakage limits. • Acceptance criteria for the plugging and repair of flawed tubes are incorporated in the plant technical specifications.	

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** plants may apply for changes in their technical specifications to provide an alternate regulatory basis for SG degradation management.	
"	**D** the plant technical specifications, incorporating NEI 97-06 as approved by the staff and any other alternate regulatory bases for SG degradation management that have been previously approved by the staff for that plant, are adequate to manage the effects of aging on the SG tubes. However, because NEI 97-06 is still under staff review, until the staff has approved NEI 97-06, the applicant's program should be reviewed on a plant-specific basis.	
1. Scope of Program	**A** The scope of the program is specific to SG tubes.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment
"	**B** The program includes preventive measures to mitigate degradation related to corrosion phenomena; assessment of degradation mechanisms; inservice inspection (ISI) of steam generator tubes to detect degradation; evaluation and plugging or repair, as needed; and leakage monitoring to maintain the structural and leakage integrity of the pressure boundary.	
"	**C** Tube inspection scope and frequency, plugging or repair, and leakage monitoring are in accordance with the plant technical specifications.	

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
2. Preventive Actions:	**A** The program includes preventive measures to mitigate degradation related to corrosion phenomena. • The guidelines in NEI 97-06 include foreign material exclusion as a means to inhibit fretting and wear degradation. • The water chemistry program for PWRs relies on monitoring and control of reactor water chemistry based on the EPRI guidelines in TR-105714 for primary water chemistry and TR-102134 for secondary water chemistry. The program description and the evaluation and technical basis of monitoring and maintaining reactor water chemistry are presented in Chapter XI.M2, "Water Chemistry," of this report.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** The inspection activities in the program detect flaws in tubing or degradation of secondary side internals needed to maintain tubing integrity.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Flaws are removed based on technical specification repair criteria.	
"	**C** Degradation of steam generator internals is evaluated for corrective actions.	
4. Detection of Aging Effects:	**A** The inspection requirements in the technical specifications are intended to detect tube degradation (i.e., aging effects), if it should occur.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** The NEI 97-06 document, which is currently under NRC staff review, provides additional guidance on inspection programs to detect degradation.	
"	**C** The intent of the inspection and repair criteria is to provide assurance of continued tube integrity between inspections.	
5. Monitoring and Trending:	**A** Condition monitoring assessments are performed to determine whether structural and accident leakage criteria have been satisfied.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Operational assessments are performed after inspections to verify that structural and leakage integrity are maintained during the operating interval until the next required inspection, which is selected in accordance with the technical specifications and staff approved NEI 97-06 guidelines.	
"	**C** Comparison of the results of the condition monitoring assessment with the predictions of the previous operational assessment provides feedback for evaluation of the adequacy of the operational assessment and additional insights that can be incorporated into the next operational assessment.	
6. Acceptance Criteria:	**A** Assessment of tube integrity and plugging or repair criteria of flawed tubes is in accordance with the plant technical specifications.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
“	**B** The criteria for plugging or repairing SG tubes are based on NRC RG 1.121 or other criteria previously reviewed and approved by the staff and incorporated into the plant technical specifications. Some examples that are applicable under certain circumstances include P*, F*, L*, or NRC GL 95-05.	
“	**C** For general and pitting corrosion, the acceptance criteria are in accordance with staff approved NEI 97-06 guidelines.	
“	**D** Also, loose parts or foreign objects that are found are removed from the SGs unless it can be shown by evaluation that these objects do not cause unacceptable tube damage. The evaluation is to define an acceptable operating interval.	
“	**E** For Westinghouse steam generator tube plugs, limits for the life of the plug and correlations for estimating their life are contained in WCAP-12244 and WCAP-12245.	
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
10. Operating Experience:	**A** Failures to detect some flaws, uncertainties in flaw sizing, inaccuracies in flaw locations, and the inability to detect some cracks at locations with dents have been reviewed in NRC Information Notice (IN) 97-88. Recent experience indicates the importance of performing a complete inspection by using appropriate techniques and equipment for the reliable detection of tube degradation and to provide assurance that new forms of degradation are detected. Implementation of the program provides reasonable assurance that SG tube integrity is maintained consistent with the plant's licensing basis for the period of extended operation. Experience with the condition and operational assessments required for plants that have implemented the alternate repair criteria in NRC GL 95-05 has shown that the predictions of the operational assessments have generally been consistent with the results of the subsequent condition monitoring assessments. In cases where discrepancies have been noted, adjustments have been made in the operational assessment models to improve agreement in subsequent assessments. In addition, NEI has prepared NEI 97-06 to incorporate lessons learned from plant operation experience and SG inspections and is under staff review.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.19 Structural Monitoring Program

This AMP requires auditing against the following three (3) GALL AMPs:

XI.S5 Masonry Wall Program
XI.S6 Structures Monitoring Program
XI.S7 RG 1.127, Inspection Of Water-Control Structures Associated With Nuclear Power Plants

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.19 Structural Monitoring Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.S5 Masonry Wall Program

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** Nuclear Regulatory Commission (NRC) IE Bulletin (IEB) 80-11, "Masonry Wall Design," and NRC Information Notice (IN) 87-67, "Lessons Learned from Regional Inspections of Licensee Actions in Response to IE Bulletin 80-11," constitute an acceptable basis for a masonry wall aging management program (AMP).	**Consistent with GALL AMP:** ☐ Yes ☐ No **Document(s) used to confirm Criteria:** Comment:
"	**B** The objective of the masonry wall program is to manage aging effects so that the evaluation basis established for each masonry wall within the scope of license renewal remains valid through the period of extended operation. Since the issuance of NRC IEB 80-11 and NRC IN 87-67, the NRC promulgated 10 CFR 50.65, the Maintenance Rule. Note to reviewer: Since the issuance of NRC IEB 80-11 and NRC IN 87-67, the NRC promulgated 10 CFR 50.65, the Maintenance Rule. Masonry walls may be inspected as part of the Structures Monitoring Program (XI.S6) conducted for the Maintenance Rule, provided the ten attributes described below are incorporated.	**Consistent with GALL AMP:** ☐ Yes ☐ No **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** Important elements in the evaluation of many masonry walls during the NRC IEB 80-11 program included (1) installation of steel edge supports to provide a sound technical basis for boundary conditions used in seismic analysis and (2) installation of steel bracing to ensure containment of unreinforced masonry walls during a seismic event. Consequently, in addition to the development of cracks in the masonry walls, loss of function of the structural steel supports and bracing would also invalidate the evaluation basis. Note to reviewer: See GALL Vol. 2, III.B5. Steel supports for masonry walls are included in the category of miscellaneous structural steel supports. The Structures Monitoring Program is the identified AMP. Reviewer should confirm that the applicant has credited an appropriate AMP to manage aging of steel supports/bracing for masonry walls. **How can this be audit?**	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
1. Scope of Program	**A** The scope includes all masonry walls identified as performing intended functions in accordance with 10 CFR 54.4.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
2. Preventive Actions:	**A** No specific preventive actions are required.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
3. Parameters Monitored/Inspected:	**A** The primary parameter monitored is wall cracking that could potentially invalidate the evaluation basis.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** Visual examination of the masonry walls by qualified inspection personnel is sufficient. The frequency of inspection is selected to ensure there is no loss of intended function between inspections.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** The inspection frequency may vary from wall to wall, depending on the significance of cracking in the evaluation basis.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Unreinforced masonry walls that have not been contained by bracing warrant the most frequent inspection, because the development of cracks may invalidate the existing evaluation basis.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
5. Monitoring and Trending:	**A** Trending is not required. Monitoring is achieved by periodic examination for cracking.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** For each masonry wall, the extent of observed cracking of masonry and degradation of steel edge supports and bracing is not to invalidate the evaluation basis.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Corrective actions are taken if the extent of cracking and steel degradation is sufficient to invalidate the evaluation basis.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** An option is to develop a new evaluation basis that accounts for the degraded condition of the wall (i.e., acceptance by further evaluation).	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
10. Operating Experience:	**A** Since 1980, masonry walls that perform an intended function have been systematically identified through licensee programs in response to NRC IEB 80-11, USI A-46, and 10 CFR 50.48. NRC IN 87-67 documented lessons learned from the NRC IEB 80-11 program, and provided recommendations for administrative controls and periodic inspection to ensure that the evaluation basis for each safety-significant masonry wall is maintained. Whether conducted as a stand-alone program or as part of structures monitoring for MR, a masonry wall AMP that incorporates the recommendations delineated in NRC IN 87-67 should ensure that the intended functions of all masonry walls within the scope of license renewal are maintained for the period of extended operation.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
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ENHANCEMENTS

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AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.19 Structural Monitoring Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.S6 Structures Monitoring Program

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** Implementation of structures monitoring under 10 CFR 50.65 (the Maintenance Rule) is addressed in Nuclear Regulatory Commission (NRC) Regulatory Guide (RG) 1.160, Rev. 2, and NUMARC 93-01, Rev. 2. These two documents provide guidance for development of licensee-specific programs to monitor the condition of structures and structural components within the scope of the Maintenance Rule, such that there is no loss of structure or structural component intended function. Because structures monitoring programs are licensee-specific, the Evaluation and Technical Basis for this aging management program (AMP) is based on the implementation guidance provided in Regulatory Guide 1.160, Rev. 2, and NUMARC 93-01, Rev. 2. Existing licensee-specific programs developed for the implementation of structures monitoring under 10 CFR 50.65 are acceptable for license renewal provided these programs satisfy the 10 attributes described below.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** If protective coatings are relied upon to manage the effects of aging for any structures included in the scope of this AMP, the structures monitoring program is to address protective coating monitoring and maintenance.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
1. Scope of Program	**A** The applicant specifies the structure/aging effect combinations that are managed by its structures monitoring program.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
2. Preventive Actions:	**A** No preventive actions are specified.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** For each structure/aging effect combination, the specific parameters monitored or inspected are selected to ensure that aging degradation leading to loss of intended functions will be detected and the extent of degradation can be determined.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Parameters monitored or inspected are to be commensurate with industry codes, standards and guidelines, and are to also consider industry and plant-specific operating experience.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Although not required, ACI 349.3R-96 and ANSI/ASCE 11-90 provide an acceptable basis for selection of parameters to be monitored or inspected for concrete and steel structural elements and for steel liners, joints, coatings, and waterproofing membranes (if applicable).	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**D** If necessary for managing settlement and erosion of porous concrete subfoundations, the continued functionality of a site de-watering system is to be monitored.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**E** The plant-specific structures monitoring program is to contain sufficient detail on parameters monitored or inspected to conclude that this program attribute is satisfied.	
4. Detection of Aging Effects:	**A** For each structure/aging effect combination, the inspection methods, inspection schedule, and inspector qualifications are selected to ensure that aging degradation will be detected and quantified before there is loss of intended functions.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Inspection methods, inspection schedule, and inspector qualifications are to be commensurate with industry codes, standards and guidelines, and are to also consider industry and plant-specific operating experience.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** Although not required, ACI 349.3R-96 and ANSI/ASCE 11-90 provide an acceptable basis for addressing detection of aging effects.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**D** The plant-specific structures monitoring program is to contain sufficient detail on detection to conclude that this program attribute is satisfied.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** Regulatory Position 1.5, "Monitoring of Structures," in RG 1.160, Rev. 2, provides an acceptable basis for meeting the attribute.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** A structure is monitored in accordance with 10 CFR 50.65 (a)(2) provided there is no significant degradation of the structure.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** A structure is monitored in accordance with 10 CFR 50.65 (a)(1) if the extent of degradation is such that the structure may not meet its design basis or, if allowed to continue uncorrected until the next normally scheduled assessment, may not meet its design basis.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** For each structure/aging effect combination, the acceptance criteria are selected to ensure that the need for corrective actions will be identified before loss of intended functions.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Acceptance criteria are to be commensurate with industry codes, standards and guidelines, and are to also consider industry and plant-specific operating experience.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** Although not required, ACI 349.3R-96 provides an acceptable basis for developing acceptance criteria for concrete structural elements, steel liners, joints, coatings, and waterproofing membranes.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**D** The plant-specific structures monitoring program is to contain sufficient detail on acceptance criteria to conclude that this program attribute is satisfied.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** Although in many plants structures monitoring programs have only recently been implemented, plant maintenance has been ongoing since initial plant operation. A plant-specific program that includes the attributes described above will be an effective AMP for license renewal.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

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AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.19 Structural Monitoring Program

REVIEWER: _____
DATE: _____

GALL AMP: XI.S7 RG 1.127, Inspection Of Water-Control Structures Associated With Nuclear Power Plants

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** Nuclear Regulatory Commission (NRC) Regulatory Guide (RG) 1.127, Revision 1, "Inspection of Water-Control Structures Associated with Nuclear Power Plants," describes an acceptable basis for developing an inservice inspection and surveillance program for dams, slopes, canals, and other water-control structures associated with emergency cooling water systems or flood protection of nuclear power plants.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Water-control structures covered by the RG 1.127 program include concrete structures; embankment structures; spillway structures and outlet works; reservoirs; cooling water channels and canals, and intake and discharge structures; and safety and performance instrumentation.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**C** For plants not committed to RG 1.127, Revision 1, aging management of water-control structures may be included in the Structures Monitoring Program (XI.S6). However, details pertaining to water-control structures are to incorporate the attributes described in XI.S7.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
1. Scope of Program	**A** RG 1.127 applies to water-control structures associated with emergency cooling water systems or flood protection of nuclear power plants.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**B** The water-control structures included in the RG 1.127 program are concrete structures; embankment structures; spillway structures and outlet works; reservoirs; cooling water channels and canals, and intake and discharge structures; and safety and performance instrumentation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
2. Preventive Actions:	**A** No preventive actions are specified; RG 1.127 is a monitoring program.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** RG 1.127 identifies the parameters to be monitored and inspected for water-control structures. The parameters vary depending on the particular structure. Parameters to be monitored and inspected for concrete structures include cracking., movements (e.g., settlement, heaving, deflection), conditions at junctions with abutments and embankments, erosion, cavitation, seepage, and leakage.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Parameters to be monitored and inspected for earthen embankment structures include settlement, depressions, sink holes, slope stability (e.g., irregularities in alignment and variances from originally constructed slopes), seepage, proper functioning of drainage systems, and degradation of slope protection features.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**C** Further details of parameters to be monitored and inspected for these and other water-control structures are specified in Section C.2 of RG 1.127.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** Visual inspections are primarily used to detect degradation of water-control structures.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** RG 1.127 indicates that the available records and readings of installed instruments are to be reviewed to detect any unusual performance or distress that may be indicative of degradation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** RG 1.127 describes periodic inspections, to be performed at least once every five years.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**D** RG 1.127 also describes special inspections immediately following the occurrence of significant natural phenomena, such as large floods, earthquakes, hurricanes, tornadoes, and intense local rainfalls.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** Water-control structures are monitored by periodic inspection as described in RG 1.127.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** In addition to monitoring the aging effects identified in Attribute (3) above, inspections also monitor the adequacy and quality of maintenance and operating procedures. RG 1.127 does not discuss trending.	
6. Acceptance Criteria:	**A** Although not required, plant-specific acceptance criteria based on Chapter 5 of ACI 349.3R-96 are acceptable	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** Acceptance criteria for earthen structures such as dams, canals, and embankments are to be consistent with programs falling within the regulatory jurisdiction of the Federal Energy Regulatory Commission (FERC) or the U.S. Army Corps of Engineers.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** Degradation of water-control structures has been detected, through RG 1.127 programs, at a number of nuclear power plants, and in some cases, it has required remedial action. NOTE: For dam inspection and maintenance, programs under the regulatory jurisdiction of FERC or the U.S. Army Corps of Engineers, continued through the period of extended operation, will be adequate for the purpose of aging management. For programs not falling under the regulatory jurisdiction of FERC or the U.S. Army Corps of Engineers, the staff will evaluate the effectiveness of the aging management program based on compatibility to the common practices of the FERC and Corps programs.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.21 Water Chemistry Program

This AMP requires auditing against the following GALL AMP:

XI.M2 Water Chemistry

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B2.1.21 Water Chemistry Program

REVIEWER: _____

DATE: _____

GALL AMP: XI.M2 Water Chemistry

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The main objective of this program is to mitigate damage caused by corrosion and stress corrosion cracking (SCC). The water chemistry program for boiling water reactors (BWRs) relies on monitoring and control of reactor water chemistry based on guidelines in the boiling water reactor vessel and internals project (BWRVIP)-29 (Electric Power Research Institute [EPRI] TR-103515). The BWRVIP-29 has three sets of guidelines: one for primary water, one for condensate and feedwater, and one for control rod drive (CRD) mechanism cooling water. The water chemistry program for pressurized water reactors (PWRs) relies on monitoring and control of reactor water chemistry based on the EPRI guidelines in TR-105714 for primary water chemistry and TR-102134 for secondary water chemistry. The water chemistry programs are generally effective in removing impurities from intermediate and high flow areas. The Generic Aging Lessons Learned (GALL) report identifies those circumstances in which the water chemistry program is to be augmented to manage the effects of aging for license renewal Accordingly, in certain cases as identified in the GALL Report, verification of the effectiveness of the chemistry control program is undertaken to ensure that significant degradation is not occurring and the component intended function will be maintained during the extended period of operation. As discussed in the GALL Report for these specific cases, an acceptable verification program is a one-time inspection of selected components at susceptible locations in the system.	**Consistent with GALL AMP:** ☐ Yes ☐ No **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
1. Scope of Program	**A** The program includes periodic monitoring and control of known detrimental contaminants such as chlorides, fluorides (PWRs only), dissolved oxygen, and sulfate concentrations below the levels known to result in loss of material or crack initiation and growth. Water chemistry control is in accordance with the guidelines in BWRVIP-29 (EPRI TR-103515) for water chemistry in BWRs; EPRI TR-105714, Rev. 3 and PWRs; EPRI TR102134, Rev. 3, for primary water chemistry in PWRs; EPRI TR-102134, Rev. 3, for secondary water chemistry in PWRs; or later revisions or updates of these reports as approved by the staff.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
2. Preventive Actions:	**A** The program includes specifications for chemical species , sampling and analysis frequencies, and corrective actions for control of reactor water chemistry.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** System water chemistry is controlled to minimize contaminant concentration and mitigate loss of material due to general, crevice and pitting corrosion and crack initiation and growth caused by SCC.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** The concentration of corrosive impurities listed in the EPRI guidelines discussed above, which include chlorides, fluorides (PWRs only), sulfates, dissolved oxygen, and hydrogen peroxide, are monitored to mitigate degradation of structural materials. Water quality (pH and conductivity) is also maintained in accordance with the guidance. Chemical species and water quality are monitored by in process methods or through sampling. The chemistry integrity of the samples is maintained and verified to ensure that the method of sampling and storage will not cause a change in the concentration of the chemical species in the samples.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** *BWR Water Chemistry:* The guidelines in BWRVIP-29 (EPRI TR-103515) for BWR reactor water recommend that the concentration of chlorides, sulfates, and dissolved oxygen are monitored and kept below the recommended levels to mitigate corrosion. The two impurities, chlorides and sulfates, determine the coolant conductivity; dissolved oxygen, hydrogen peroxide, and hydrogen determine electrochemical potential (ECP). The EPRI guidelines recommend that the coolant conductivity and ECP are also monitored and kept below the recommended levels to mitigate SCC and corrosion in BWR plants. The EPRI guidelines in BWRVIP-29 (TR-103515) for BWR feedwater, condensate, and control rod drive water recommends that conductivity, dissolved oxygen level, and concentrations of iron and copper (feedwater only) are monitored and kept below the recommended levels to mitigate SCC. The EPRI guidelines in BWRVIP-29 (TR-103515) also include recommendations for controlling water chemistry in auxiliary systems: torus/pressure suppression chamber, condensate storage tank, and spent fuel pool.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**C** *PWR Primary Water Chemistry:* The EPRI guidelines (EPRI TR-105714) for PWR primary water chemistry recommend that the concentration of chlorides, fluorides, sulfates, lithium, and dissolved oxygen and hydrogen are monitored and kept below the recommended levels to mitigate SCC of austenitic stainless steel, Alloy 600, and Alloy 690 components. TR-105714 provides guidelines for chemistry control in PWR auxiliary systems such as boric acid storage tank, refueling water storage tank, spent fuel pool, letdown purification systems, and volume control tank.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**D** *PWR Secondary Water Chemistry:* The EPRI guidelines (EPRI TR-102134) for PWR secondary water chemistry recommend monitoring and control of chemistry parameters (e.g., pH level, cation conductivity, sodium, chloride, sulfate, lead, dissolved oxygen, iron, copper, and hydrazine) to mitigate steam generator tube degradation caused by denting, intergranular attack (IGA), outer diameter stress corrosion cracking (ODSCC), or crevice and pitting corrosion. The monitoring and control of these parameters, especially the pH level, also mitigates general (carbon steel components), crevice, and pitting corrosion of the steam generator shell and the balance of plant materials of construction (e.g., carbon steel, stainless steel, and copper).	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** This is a mitigation program and does not provide for detection of any aging effects, such as loss of material and crack initiation and growth.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** The frequency of sampling water chemistry varies (e.g., continuous, daily, weekly, or as needed) based on plant operating conditions and the EPRI water chemistry guidelines.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** Maximum levels for various contaminants are maintained below the system specific limits as indicated by the limits specified in the corresponding EPRI water chemistry guidelines. Any evidence of the presence of aging effects or unacceptable water chemistry results is evaluated, the root cause identified, and the condition corrected.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** Any evidence of the presence of aging effects or unacceptable water chemistry results is evaluated, the root cause identified, and the condition corrected.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** *BWR:* Intergranular stress corrosion cracking (IGSCC) has occurred in small- and large-diameter BWR piping made of austenitic stainless steels and nickel-base alloys. Significant cracking has occurred in recirculation, core spray, residual heat removal (RHR) systems, and reactor water cleanup (RWCU) system piping welds. IGSCC has also occurred in a number of vessel internal components, including core shroud, access hole cover, top guide, and core spray spargers (Nuclear Regulatory Commission [NRC] Information Bulletin 80-13, NRC Information Notice [IN] 95-17, NRC General Letter [GL] 94-03, and NUREG-1544). No occurrence control systems exposed to sodium pentaborate solution has ever been reported (NUREG/CR-6001).	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** *PWR Primary System:* The primary pressure boundary piping of PWRs has generally not been found to be affected by SCC because of low dissolved oxygen levels and control of primary water chemistry. However, the potential for SCC exists due to inadvertent introduction of contaminants into the primary coolant system from unacceptable levels of contaminants in the boric acid; introduction through the free surface of the spent fuel pool, which can be a natural collector of airborne contaminants; or introduction of oxygen during cooldown (NRC IN 84–18). Ingress of demineralizer resins into the primary system has caused IGSCC of Alloy 600 vessel head penetrations (NRC IN 96-11, NRC GL 97-01). Inadvertent introduction of sodium thiosulfate into the primary system has caused IGSCC of steam generator tubes. The SCC has occurred in safety injection lines (NRC INs 97-19 and 84-18), charging pump casing cladding (NRC INs 80-38 and 94-63), instrument nozzles in safety injection tanks (NRC IN 91-05), and safety-related SS piping systems that contain oxygenated, stagnant, or essentially stagnant borated coolant (NRC IN 97-19). Steam generator tubes and plugs and Alloy 600 penetrations have experienced primary water stress corrosion cracking (PWSCC) (NRC INs 89-33, 94-87, 97-88, 90-10, and 96-11; NRC Bulletin 89-01 and its two supplements).	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**C** *PWR Secondary System:* Steam generator tubes have experienced ODSCC, IGA, wastage, and pitting (NRC I N 97-88, NRC GL 95-05). Carbon steel support plates in steam generators have experienced general corrosion. The steam generator shell has experienced pitting and stress corrosion cracking (NRC INs 82-37, 85-65, and 90-04).	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
1.				
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ENHANCEMENTS

Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
1.				
2.				
…				

Document Reviewed During Audit:

DOCUMENT NUMBER	IDENTIFIER (NUMBER)	TITLE	REVISION AND/OR DATE
1.			
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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B3.1 Electrical Equipment Qualification Program

This AMP requires auditing against the following GALL AMP:

X.E1 Environmental Qualification (EQ) Of Electric Components

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B3.1 Electrical Equipment Qualification Program

REVIEWER: _____
DATE: _____

GALL AMP: X.E1 Environmental Qualification (EQ) Of Electric Components

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** The 10 CFR 50.49 defines the scope of components to be included requires the preparation and maintenance of a list of in-scope components	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Requires the preparation and maintenance of a qualification file that includes component performance specifications, electrical characteristics, and the environmental conditions to which the components could be subjected	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** The 10 CFR 50.49(e)(5) contains provisions for aging that require, in part, consideration of all significant types of aging degradation that can affect component functional capability	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**D** The 10 CFR 50.49(e) also requires replacement or refurbishment of components not qualified for the current license term prior to the end of designated life, unless additional life is established through ongoing qualification	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**E** The 10 CFR 50.49(k) and (l) permit different qualification criteria to apply based on plant and component vintage. Supplemental EQ regulatory guidance for compliance with these different qualification criteria is provided in the DOR Guidelines, Guidelines for Evaluating Environmental Qualification of Class 1E Electrical Equipment in Operating Reactors; NUREG-0588, Interim Staff Position on Environmental Qualification of Safety-Related Electrical Equipment; and Regulatory Guide 1.89, Rev. 1, Environmental Qualification of Certain Electric Equipment Important to Safety for Nuclear Power Plants.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**F** Important attributes for the reanalysis of an aging evaluation include analytical methods, data collection and reduction methods, underlying assumptions, acceptance criteria, and corrective actions (if acceptance criteria are not met).	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**G** Generic Safety Issue (GSI) 168, which is related to low-voltage EQ instrumentation and control cables, is currently an open generic issue. NRC research is ongoing to provide information to resolve it. An applicant is to address GSI-168 in its application for staff review.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
EQ Component Reanalysis Attributes	**A** Reanalysis of an aging evaluation to extend the qualification of a component is performed on a routine basis pursuant to 10 CFR 50.49(e) as part of an EQ program.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**B** The analytical models used in the reanalysis of an aging evaluation are the same as those previously applied during the prior evaluation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**C** For license renewal, one acceptable method of establishing the 60-year normal radiation dose is to multiply the 40-year normal radiation dose by 1.5 (that is, 60 years/40 years). The result is added to the accident radiation dose to obtain the total integrated dose for the component.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**D** Temperature data used in an aging evaluation is to be conservative and based on plant design temperatures or on actual plant temperature data.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**E** plant temperature data can be obtained in several ways, including monitors used for technical specification compliance, other installed monitors, measurements made by plant operators during rounds, and temperature sensors on large motors (while the motor is not running).	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**F** A representative number of temperature measurements are conservatively evaluated to establish the temperatures used in an aging evaluation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**G** Plant temperature data may be used in an aging evaluation in different ways, such as (a) directly applying the plant temperature data in the evaluation, or (b) using the plant temperature data to demonstrate conservatism when using plant design temperatures for an evaluation.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**H** Any changes to material activation energy values as part of a reanalysis are to be justified on a plant-specific basis.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**I** Similar methods of reducing excess conservatism in the component service conditions used in prior aging evaluations can be used for radiation and cyclical aging.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**J** When unexpected adverse conditions are identified during operational or maintenance activities that affect the normal operating environment of a qualified component, the affected EQ component is evaluated and appropriate corrective actions are taken, which may include changes to the qualification bases and conclusions.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
"	**K** If the qualification cannot be extended by reanalysis, the component is to be refurbished, replaced, or requalified prior to exceeding the period for which the current qualification remains valid. A reanalysis is to be performed in a timely manner (that is, sufficient time is available to refurbish, replace, or requalify the component if the reanalysis is unsuccessful).	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
1. Scope of Program	**A** EQ programs apply to certain electrical components that are important to safety and could be exposed to harsh environment accident conditions, as defined in 10 CFR 50.49.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
2. Preventive Actions:	**A** The 10 CFR 50.49 does not require actions that prevent aging effects.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** EQ component qualified life is not based on condition or performance monitoring.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
4. Detection of Aging Effects:	**A** The 10 CFR 50.49 does not require the detection of aging effects for in-service components.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** The 10 CFR 50.49 does not require monitoring and trending of component condition or performance parameters of in-service components to manage the effects of aging.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
6. Acceptance Criteria:	**A** 10 CFR 50.49 acceptance criteria are that an inservice EQ component is maintained within the bounds of its qualification basis, including (a) its established qualified life and (b) continued qualification for the projected accident conditions.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** When monitoring is used to modify a component qualified life, plant-specific acceptance criteria are established based on applicable 10 CFR 50.49(f) qualification methods.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
7. *Corrective Actions:*	Not reviewed by RLEP-B project team	N/A
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A
10. Operating Experience:	**A** EQ programs include consideration of operating experience to modify qualification bases and conclusions, including qualified life. Compliance with 10 CFR 50.49 provides reasonable assurance that components can perform their intended functions during accident conditions after experiencing the effects of inservice aging.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
1.				
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ENHANCEMENTS

Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
1.				
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Document Reviewed During Audit:

DOCUMENT NUMBER	IDENTIFIER (NUMBER)	TITLE	REVISION AND/OR DATE
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PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B3.2 Fatigue Monitoring Program

This AMP requires auditing against the following GALL AMP:

X.M1 Metal Fatigue of Reactor Coolant Pressure Boundary

AUDIT WORKSHEET
GALL REPORT AMP

PLANT: Palisades Nuclear Plant (PNP)

LRA AMP: B3.2 Fatigue Monitoring Program

REVIEWER: _____

DATE: _____

GALL AMP: X.M1 Metal Fatigue of Reactor Coolant Pressure Boundary

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
Program Description	**A** In order not to exceed the design limit on fatigue usage, the aging management program (AMP) monitors and tracks the number of critical thermal and pressure transients for the selected reactor coolant system components.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**B** AMP addresses the effects of the coolant environment on component fatigue life by assessing the impact of the reactor coolant environment on a sample of critical components that includes, as a minimum, those components selected in NUREG/CR-6260.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:
"	**C** The sample of critical components can be evaluated by applying environmental correction factors to the existing ASME Code fatigue analyses. Formulas for calculating the environmental life correction factors are contained in NUREG/CR-6583 for carbon and low-alloy steels and in NUREG/CR-5704 for austenitic stainless steels.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
"	**D** As evaluated below, this is an acceptable option for managing metal fatigue for the reactor coolant pressure boundary, considering environmental effects. Thus, no further evaluation is recommended for license renewal if the applicant selects this option under 10 CFR 54.21(c)(1)(iii) to evaluate metal fatigue for the reactor coolant pressure boundary.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
1. Scope of Program:	**A** The program includes preventive measures to mitigate fatigue cracking of metal components of the reactor coolant pressure boundary caused by anticipated cyclic strains in the material.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment
2. Preventive Actions:	**A** Maintaining the fatigue usage factor below the design code limit and considering the effect of the reactor water environment, as described under the program description, will provide adequate margin against fatigue cracking of reactor coolant system components due to anticipated cyclic strains.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
3. Parameters Monitored/Inspected:	**A** The program monitors all plant transients that cause cyclic strains, which are significant contributions to the fatigue usage factor. The number of plant transients that cause significant fatigue usage for each reactor coolant pressure boundary component is to be monitored.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
"	**B** Alternatively, more detailed local monitoring of the plant transient may be used to compute the actual fatigue usage for each transient.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
4. Detection of Aging Effects:	**A** The program provides for periodic update of the fatigue usage calculations.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
5. Monitoring and Trending:	**A** The program monitors a sample of high fatigue usage locations. As a minimum, this sample is to include the locations identified in NUREG/CR-6260.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
6. Acceptance Criteria:	**A** Maintain the fatigue usage below the design code limit considering environmental fatigue effects.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
7. Corrective Actions:	**A** Acceptable corrective actions include a more rigorous analysis of the component to demonstrate that the design code limit will not be exceeded, repair, or replacement of the component. For programs that monitor a sample of high fatigue usage locations, corrective actions include a review of additional affected reactor coolant pressure boundary locations.	**Consistent with GALL AMP:** ☐ **Yes** ☐**No** **Document(s) used to confirm Criteria:** Comment:
8. Confirmation Process:	Not reviewed by RLEP-B project team	N/A
9. Administrative Controls:	Not reviewed by RLEP-B project team	N/A

PROGRAM ELEMENT	AUDITABLE GALL CRITERIA	DOCUMENTATION OF AUDIT FINDING
10. Operating Experience:	**A** The program reviews industry experience regarding fatigue cracking. Applicable experience with fatigue cracking is to be considered in selecting the monitored locations.	**Consistent with GALL AMP:** ☐ **Yes** ☐ **No** **Document(s) used to confirm Criteria:** Comment:

EXCEPTIONS

Item Number	Program Elements	LRA Exception Description	Basis for Accepting Exception	Documents Reviewed (Identifier, Para.# and/or Page #)
1.				
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ENHANCEMENTS

Item Number	Program Elements	LRA Enhancement Description	Basis for Accepting Enhancement	Documents Reviewed (Identifier, Para.# and/or Page #)
1.				
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Document Reviewed During Audit:

DOCUMENT NUMBER	IDENTIFIER (NUMBER)	TITLE	REVISION AND/OR DATE
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Appendix F

Plant-Specific AMP Audit/Review Worksheets

Appendix F

Plant-Specific AMP Audit/Review Worksheets

There are no plant-specific AMPs assigned to the project team, therefore, no worksheets are provided.

Appendix G

AMR Comparison Worksheets

PNP AMR Component (Table 1) Worksheet			Audit Date:
Unit:	Table No.:	Chapter:	
Auditor Name(s) :			

The audit team verified that items in Table 3.x.1 (Table 1) correspond to items in the GALL Volume 1, Table X. All items applicable to PWRs in Table 1 were reviewed and are addressed in the following table.

Item No.	Further Evaluation Recommended	Discussion

Audit Remarks (Document all questions for the applicant here):

No.	Question for applicant (draft per RAI guidance)	Response (with date)

References/Documents Used:

1.
2.
3.
4.

PNP AMR MEAP Comparison (Table 2) Worksheet			Audit Date:
Unit:	Table No.:	Chapter:	
Auditor Name(s) :			

Line items to which Notes A, B, C, D, and E are applied or for which a precedent was cited (except for those assigned to DE) were reviewed for: 1) consistency with NUREG-1801, Volume 2 tables, and 2) adequacy of the aging managing programs. All items in the Table 2 of the system named above are acceptable with the exception of items in **boldface** type. (Reviewers need not duplicate information in the 2nd-5th columns that are reflected in the discussion/draft audit report.)

LRA Page No.	Component Type	Material	Environment	Aging Effect	Note	Discussion (draft as Audit Report input)

Audit Remarks (Document all questions for the applicant here):

No.	Question for applicant (draft per RAI guidance)	Response (with date)

References/Documents Used:

5.
6.
7.

Appendix H

Acronyms, Abbreviations, and Initialisms

Appendix H

Acronyms, Abbreviations, and Initialisms

ADAMS	Agencywide Documents Access and Management System
AMP	aging management program
AMR	aging management review
ASME	American Society of Mechanical Engineers
BTP	Branch Technical Position
CLB	current licensing basis
DE	Division of Engineering
DIPM	Division of Inspection Program Management
EPRI	Electric Power Research Institute
FSAR	final safety analysis report
GALL	Generic Aging Lessons Learned
ISG	interim staff guidance
ISL	Information Systems Laboratories, Inc.
LRA	license renewal application
NEI	Nuclear Energy Institute
NMC	Nuclear Management Company
NRC	U.S. Nuclear Regulatory Commission
NRR	Office of Nuclear Reactor Regulation
PNP	Palisades Nuclear Plant
RAI	request for additional information
RLEP-B	License Renewal and Environmental Impacts Program, Section B
RLSB	License Renewal and Standardization Branch
SC	structures and components
SER	safety evaluation report
SRP-LR	Standard Review Plan-License Renewal
SSC	structures, systems, and components