

Audit and Review Plan for
Plant Aging Management Reviews and Programs

Monticello Nuclear Generating Plant
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Table of Contents

1. Introduction.....1

2. Background.....2

3. Objectives.....4

4. Summary of Information Provided in the License Renewal Application.....5

5. Overview of Audit, Review, and Documentation Procedure.....7

6. Planning, Audit, Review and Documentation Procedure.....10

Appendix A – Project Team Members.....A-1

Appendix B – Schedule.....B-1

Appendix C – Aging Management Program Assignments.....C-1

Appendix D – Aging Management Review Assignments.....D-1

Appendix E – Abbreviations and AcronymsE-1

Tables

Table 1 Aging Management Program Element Description.....19

Table 2 Notes for License Renewal Application Tables 3.x.2-y.....20

Figures

Figure 1 Audit of AMPs That Are Consistent With the GALL Report.....21

Figure 2 Audit of Plant-Specific AMPs.....22

Figure 3 Review of AMRs That Are Consistent With the GALL Report.....23

Audit and Review Plan for Plant Aging Management Reviews and Programs

1. INTRODUCTION

By letter dated March 24, 2005, the Nuclear Management Company, LLC submitted to the U.S. Nuclear Regulatory Commission (NRC) its application for renewal of Operating License DPR-22 for Monticello Nuclear Generating Plant (MNGP). The applicant requested renewal of the operating license for an additional 20 years beyond the 40-year current license term.

In support of the NRC staff's safety review of the license renewal application (LRA) for the Monticello Nuclear Generating Plant, the License Renewal and Environmental Impacts Program, License Renewal Section B (RLEP-B), will lead a project team, which will audit and review selected aging management reviews (AMRs) and associated aging management programs (AMPs). This document is the RLEP-B plan for auditing and reviewing the AMPs and AMRs. The project team includes the NRC staff and Advanced Technologies and Laboratories International, Inc. (ATL) engineers, who are listed in Appendix A, "Project Team Members," of this audit plan.

The project team will audit and review its assigned AMPs and AMRs against the requirements and guidance contained in the following documents:

- _ Title 10 of the *Code of Federal Regulations*, Part 54, "Requirements for Renewal of Operating Licenses for Nuclear Power Plants"
- _ NUREG-1800, "Standard Review Plan for Review of License Renewal Application for Nuclear Power Plants" (SRP-LR), issued July 2001
- _ NUREG-1801, "Generic Aging Lessons Learned (GALL) Report," issued July 2001

For the scope of work defined in this audit plan, the project team will evaluate whether 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 MNGP current licensing basis (CLB) for the extended period of operation.

The project team plans to perform its work at NRC Headquarters, Rockville, Maryland; at ATL's Germantown, MD office, and at the applicant's offices at Monticello, Minnesota. The project team plans to perform its work in accordance with the schedule shown in Appendix B, "Schedule." The project team will conduct a public exit meeting at the applicant's offices in Monticello, Minnesota, after it completes its on-site work.

2. BACKGROUND

10 CFR 54.4(a) states that plant systems, structures, and components (SSCs) within the scope of license renewal are:

- (1) Safety-related SSCs which are relied upon to remain functional during and following design-basis events
- (2) All non-safety related SSCs whose failure could prevent satisfactory accomplishment of any of the functions identified for safety-related SSCs
- (3) All SSCs relied on in safety analyses or plant evaluations to perform a function that demonstrates compliance with the Commission'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 extended period of operation. 10 CFR 54.21(d) requires that the applicant submit a supplement to the updated final safety analysis report (UFSAR) 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 license renewal applications. In particular, the SRP-LR provides guidance for further evaluation of aging management programs as recommended by the GALL report and identifies associated technical positions that are acceptable to the staff.

The GALL Report contains the staff's generic evaluation of the existing plant programs and documents the technical basis for determining where existing programs are adequate without modification and where existing programs should be augmented for the extended period of operation. The evaluation results documented in the GALL Report indicate that many of the existing programs are adequate to manage the aging effects for particular structures or components for license renewal without change. If an applicant commits to implementing these staff-approved aging management programs (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 the structures and components that are within the scope of license renewal and subject to an AMP. For each structure or component in a system, the GALL Report identifies the associated materials, environments, and aging effects to which the components are exposed, and the AMPs that are acceptable to the staff for managing the aging effects. The GALL Report also identifies those AMPs that require further evaluation.

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 determines 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. 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 evaluate compliance with 10 CFR 54.21(a)(3) such that for each identified SSC the applicant demonstrates 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. The audit and review process ensures that for each structure and component that is within the scope of the project team's review the effects of aging will be adequately managed.

The audit and review procedure is described in Sections 5 and 6 of this plan. The plan objectives are:

- For plant AMPs that the applicant claims are consistent with GALL AMPs, evaluate whether 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, evaluate whether 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, evaluate whether 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, evaluate whether 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, evaluate whether the applicant identified the enhancements as commitments in the UFSAR supplement or other docketed correspondence.
- For plant-specific AMPs that the applicant claims are consistent with AMPs that the staff has previously approved for another plant, verify the AMPs are acceptable on the basis of a technical review.
- For AMRs that the applicant claims are consistent with the GALL Report, evaluate whether the plant AMRs are consistent with the criteria of the GALL.

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

4. SUMMARY OF INFORMATION PROVIDED IN THE LICENSE RENEWAL APPLICATION

The MNGP 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 aging management review results for the structures and components identified by the applicant.

LRA Table 3.0-1 and Table 3.0-2 provide descriptions of the mechanical, civil, and electrical 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 a Table 1 type. For example, in the reactor vessel, internals, and 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 Vessel, Internals, and Reactor Coolant System
2	Engineered Safety Features
3	Auxiliary Systems
4	Steam and Power Conversion Systems
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 vessel, internals, and reactor coolant system" (group 1), the AMR results for the reactor head vent system (subgroup 1) are presented in LRA Table 3.1.2-1, and the results for the reactor pressure vessel (subgroup 2) are presented in LRA Table 3.1.2-2. Under the "engineered safety features" (group 2), the automatic pressure relief system (subgroup 1) results are presented in Table 3.2.2-1 of the LRA, and the combustible gas control system (subgroup 2) is in Table 3.2.2-2 of the LRA.

In LRA Tables 3.1.1 through 3.6.1 (Table 1 types), the applicant provides a summary of the comparison of its AMR results to the GALL Report. These LRA tables are similar to Tables 1

through 6 of the GALL Report, Volume 1. The applicant added a "Discussion" column, which includes additional information that may be useful to the projects team. Also, the applicant added an "Item Number" column, which 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 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 tables specific to automatic pressure relief, combustible gas control, core spray, high pressure coolant injection, primary containment mechanical, reactor core isolation cooling, residual heat removal, and secondary containment systems All LRA Table 2s consist of the following nine columns.

- _ *Component Commodity.* Column 1 identifies the component or commodity types that are subject to an AMR. The component or commodity types are listed in alphabetical order.
- _ *Intended Function.* Column 2 identifies the license renewal intended functions for the listed component and commodities. Definitions and abbreviations of intended functions are listed in Table 2.1-1 in Section 2 of the LRA.
- _ *Material.* Column 3 lists the materials of the component or commodity 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 and Table 3.0-2 for the mechanical, civil, and electrical components.
- _ *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 Program.* Column 6 lists the program(s) used to manage the aging effect.

- *NUREG-1801 Volume 2 Item.* The applicant compared each combination of component type, material, environment, aging effect requiring management, and aging management program factors listed in LRA Table 2 to the GALL Report to identify consistencies. In Column 7, the applicant 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.
- *Table 1 Item.* The applicant compared each combination of component type, material, environment, aging effect requiring management, and aging management program that has an identified GALL Report item number and a Table 1 line item reference number. Column 8 lists the corresponding line item from Table 1. If there is no corresponding item in the GALL Report, 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 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 with the NEI standardized format for license renewal applications by letter dated April 7, 2003, from P.T. Kuo, NRC, to A. Nelson, NEI (ML030990052). The standard notes are shown in Table 2 of this plan. Notes that use numeric designators are specific to Monticello Nuclear Generating Plant.

LRA Table 2 contains the aging management review results and indicates whether the results correspond to line items in the GALL Report. Correlations between a combination in LRA Table 2 and a combination in Volume 2 of the GALL Report are identified in column 7 of Table 2. 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, column 8 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 recommend a plant-specific program. In these cases, the applicant considers its AMR evaluation to be consistent with the GALL Report, if an appropriate plant-specific AMP has been credited to manage aging.

5. OVERVIEW OF AUDIT, AND DOCUMENTATION PROCEDURE

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

5.1 Aging Management Programs

Table 1 of this plan summarizes the 10 program elements that comprise an aging management program. Of these 10 program elements, program elements 1 through 6, and program element 10 are within the project team's scope of review. The NRC Division of Inspection Program Management (DIPM) is responsible for reviewing program elements 7, 8, and 9, which will be addressed as part of the applicant's quality assurance program. The results of the DIPM staff's reviews will be documented in Section 3 of the safety evaluation report associated with the LRA safety review.

The project team will review the AMPs that the applicant claims are consistent with GALL AMPs, and compare the MNGP AMP program elements 1 through 6 and program element 10 to the corresponding AMP program elements in the GALL Report. The project team will evaluate whether each MNGP AMP contains the program elements of the referenced GALL AMP, and that the conditions at the plant are bounded by the conditions identified in the GALL AMP.

The project team will evaluate each of the MNGP AMPs that have an exception or an enhancement to an associated AMP in the GALL Report. The project team will identify the difference(s) between the MNGP AMP and the associated AMP in the GALL Report, and determine whether the MNGP AMP, as modified by the difference(s), will adequately manage the aging effects for which it is credited.

The project team will review one (1) MNGP AMP that is not included in the GALL Report (i.e., plant-specific AMP). In this case, the project team will review the AMP against the seven program elements that are within its scope of review. The project team will determine whether this AMP is adequate to 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 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 recommends further evaluation.

5.3 UFSAR Supplement Review

In accordance with the SRP-LR, the project team will review the applicant's UFSAR supplement, to ensure (1) that the applicant's programs and activities credited for aging management are summarized, and (2) that any commitments to enhance the applicant's AMPs, in order to be consistent with the AMPs evaluated in the GALL Report, are documented.

Consistent with the SRP-LR, for the AMRs and associated AMPs that it will review, the project team will review the UFSAR 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 evaluate whether they are acceptable for the stated purpose.

5.4 Documents Reviewed by the Project Team

In performing its work, the project team will rely heavily on the LRA, the audit 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 evaluate whether the applicant's activities and programs

will adequately manage the effects of aging on structures and components.

5.5 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.

5.6 Documentation Prepared by the Project Team

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

5.6.1 Worksheets

Each project team member will informally document the results of his or her work on a variety of worksheets. The use of the worksheets is described in Section 6 of this plan.

5.6.2 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 project team will also track and evaluate the applicant's answers to the questions.

5.6.3 Work Packages

After each on-site audit, the project team leader, in conjunction with the project manager, will assemble work packages for any work that the project 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 gathered by the project team.

5.6.4 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 project team leader will provide the response to the project team member who prepared the RAI. The project team member will review the response and determine if it resolves the issue addressed in the RAI. The project team member will document the disposition of the RAI in the audit 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.

5.6.5 Audit Report

The project team will document the results of its work in an audit report. The project team will prepare its report as described in Section 6.4.1 of this plan and the latest version of the *RLEP-B Guidelines for Preparing Audit Reports*.

5.6.6 Safety Evaluation Report Input

The project team will prepare SER inputs that are based on the audit report, as described in Section 6.4.2 of this plan.

6. PLANNING, AUDIT, AND DOCUMENTATION PROCEDURE

This section of the audit 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 manager, the project team leader, and the applicant will establish the schedule for on-site visits. The project team leader prepares the schedule for the key milestones and activities, consistent with the overall schedule developed by the project manager. The key milestones and activities schedule for the AMP and AMR audit of the Monticello Nuclear Generating Plant license renewal application is provide in Appendix B of this audit plan.

6.1.2 Work assignments

The project team leader should use the contracting process to identify the contractor personnel who will be members of the project team. The project team leader will approve all work assignments and may re-assign work as necessary.

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

6.1.3 Training and Preparation.

The project team leader should hold a project team meeting to review the following information. Each project team member should review the relevant sections of the following documents prior to the first on-site audit.

- _ NUREG-1800, [Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants,] issued July 2001
- _ NUREG-1801, [Generic Aging Lessons Learned (GALL) Report,] issued July 2001
- _ Staff position letters concerning interim staff guidance for license renewal issues
- _ Monticello Nuclear Generating Plant License Renewal Application.

In preparation for the on-site audits, the project team members will review their assigned AMPs or AMRs and examine relevant safety evaluation reports, audit reports, and/or requests for additional information from prior staff LRA reviews. In addition, if feasible, the project team members should identify the applicant's basis documents and implementing procedures that they plan to audit on-site. Any questions identified by the project team members during the pre-audit reviews may be transmitted to the applicant prior to the on-site audits.

The project team leader is the point of contact with the licensee. Project team members may work directly with the licensee's staff to gather information and understand the information contained in the license renewal application. However, the project team leader is the only project team member who can make formal requests or agreements with the licensee.

The project team leader is the point of contact with the NRC technical staff. Project team members may work directly with the NRC technical staff to exchange technical information concerning the audit of the license renewal application. However, the project team leader is the only project team member who can make formal requests or agreements with the NRC technical staff.

The NRC Management Directives and the contract requirements will govern the project team's travel requirements, work hours, issuance of request for additional information, and control of licensee documents.

6.2 Aging Management Program Audits

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.

6.2.1 Scope of AMP Elements to be Audited

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 elements 1 through 6 and element 10. The Division of Inspection Program Management is responsible for reviewing elements 7, 8, and 9, as part of its assessment of the applicant's quality assurance program. The program elements audited or reviewed is the same for both AMPs that are consistent with the GALL Report and for plant-specific AMPs.

6.2.2 Plant AMPs That Are Consistent With the GALL Report

The flowchart for the audit of AMPs that are consistent with the GALL report is presented in Figure 1 of this audit plan. The flowchart 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. In preparation for the audit, the project team members will review each of the AMPs they have been assigned, identify the corresponding GALL AMPs, and determine the elements that will be audited. Then the project team members should identify the documents needed to perform the audit.

Once on site, the project team members should use the plant-specific basis document and implementing procedures to confirm that the AMP elements are consistent with the corresponding AMP elements in the GALL Report. In addition, the project team members should identify any exceptions to the AMP elements in the GALL Report. If an AMP element is

inconsistent with the corresponding AMP element in the GALL Report, the project team members should determine whether the inconsistency is acceptable, develop a technical basis, and document their assessments.

The project team members should confirm the effectiveness of each AMP by reviewing industry and plant-specific operating experience. The project team members should consider the following industry guidance from NEI 95-10, Revision 3, when assessing operating experience.

- 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.
- 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 NUREG-1800.
- Industry Operating Experience. Industry operating experience and its applicability should be assessed to determine whether it changes plant-specific determinations. NUREG-1801 is based upon industry operating experience prior to its date of issue. Operating experience after the issue date of NUREG-1801 should be evaluated and documented as part of the aging management review. In particular, generic communications such as a bulletin 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 a previously identified aging effect.

Any questions resulting from the audit will be discussed with the applicant, and either resolved by the project team or turned over to the NRC technical staff for resolution. 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.

6.2.4 Plant-specific AMPs

The project team will review both of the plant-specific AMPs identified in Appendix B of the MNGP LRA.

The flowchart for the review of plant-specific AMPs is presented in Figure 2 of this audit plan. The flowchart shows the activities and decisions used by the project team to review a plant-specific AMP. In preparation for the on-site audit, the assigned project team member will review the plant-specific AMP, and identify documents needed to perform the review.

Once on site, the project team member should use the plant-specific basis document and implementing procedures to confirm that the seven program elements of the plant-specific AMP

are consistent with the corresponding program elements in Section A.1.2.3 of the SRP-LR. The project team member should identify any exceptions to the program elements in Section A.1.2.3 of the SRP-LR. If a program element of the plant-specific AMP is inconsistent with the corresponding program element in Section A.1.2.3 of the SRP-LR, the project team member should determine whether the inconsistency is acceptable, develop a technical basis, and document the assessment.

The project team member should evaluate the effectiveness of the plant-specific AMP by reviewing industry and plant-specific operating. The project team member should consider the following industry guidance from NEI 95-10, Revision 3, when assessing operating experience.

- 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.
- 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 NUREG-1800.
- Industry Operating Experience. Industry operating experience and its applicability should be assessed to determine whether it changes plant-specific determinations. NUREG-1801 is based upon industry operating experience prior to its date of issue. Operating experience after the issue date of NUREG-1801 should be evaluated and documented as part of the aging management review. In particular, generic communications such as a bulletin 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 a previously identified aging effect.

Any questions resulting from the audit will be discussed with the applicant, and either resolved by the project team or turned over to the NRC technical staff for resolution. 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.

6.3 Audit of Aging Management Review (AMR) Results

There are two types of AMRs: those that the applicant claims are consistent with the GALL Report, and those that are plant-specific. The project team will review AMRs that are consistent with the AMRs in the GALL Report.

1.1.1 Scope of AMR to be Audited

The NRC staff has split the responsibility for assessing the aging management review results in the license renewal application between the project team and the NRC technical staff. The project team will assess the AMRs that are consistent with the GALL report. Each AMR line item is coded with a letter which represents a standard note designation. The letter notes are described in Table 2 of this plan. The notes coded with A through E are classified as "consistent with the GALL Report," and will be addressed by the project team in accordance with the guidance contained in this plan. Notes that use numeric designators are plant-specific and provide additional information to be considered during the staff assessment.

6.3.2 AMR Results That Are Consistent With the GALL Report

The flowchart for the audit of AMRs that are consistent with the GALL report is presented in Figures 3-1 and 3-2 of this audit plan. The flowchart shows the activities and decisions used by the project team to review and audit each plant AMR that the applicant claims is consistent with the GALL Report. In preparation for the audit, the project team members will review each of the AMRs they have been assigned and identify the corresponding AMRs in the GALL Report.

The AMR review involves evaluating whether 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, the applicant demonstrates that the effects of aging will be adequately managed so that the intended function(s) will be maintained consistent with the current licensing basis of the plant for the extended period of operation. The project team should evaluate compliance by following the process shown in Figures 3-1 and 3-2. The process is summarized below:

- Project team members should review each assigned AMR line and determine if the AMR is consistent with the GALL Report.
- Note A indicates: The applicant identifies a plant-specific AMP. 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 extended period of operation, 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, prepare a question to the applicant, in order to obtain clarification..
- Note B indicates that the identified AMP takes some exceptions to the GALL Report. The project team should evaluate the AMP exceptions and document its assessment.
- Notes C and D identify components that are not consistent with the GALL report. The project team should evaluate the acceptability of the component type for the material, environment, and aging effect. If Note D applies the project team should also evaluate the acceptability of the AMP exceptions and document the results of its assessment.
- Note E identifies an AMP that is inconsistent with the AMP identified in the GALL report. The project team should evaluate the AMP to determine if the scope of the alternate AMP

envelopes the AMR line item and satisfies 10 CFR 54.21(a)(3). The project team should document the results of its assessment.

- The project team should evaluate the corresponding LRA Table 3.X.1 entry that is referenced in LRA Table 3.X.2.Y. If applicable, the project team will 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, and document its assessment.

The project team members will prepare questions for the applicant whenever additional information or clarifications are needed. The project team will evaluate the applicant’s responses. When a response does not resolve the issue, the project team should prepare additional questions. If it is necessary for the applicant to submit additional information to resolve an issue, the applicant may submit the information as a supplement to the LRA or the NRC may issue an RAI to obtain the information. The project team leader should be consulted if docketed information is needed.

6.4 Audit Documentation

As noted in Section 5.6 of this plan, the project team will prepare an audit plan, worksheets, work packages, requests for additional information, an audit report, and a SER input. This section of the plan addresses the preparation of the audit report and the SER input.

6.4.1 Audit Report

The project team should prepare input to the audit report in accordance with the guidance provided in the Writing Guide and Template for Preparing License Renewal Application Audit Report. The audit report should follow the following format:

- Cover page
- Table of Contents
- Section 1 Introduction and General Information
 - Section 1.1 Introduction
 - Section 1.2 Background
 - Section 1.3 Summary of Information in the License Renewal Application
 - Section 1.4 Audit Scope
 - Section 1.5 Audit Process
 - Section 1.6 Exit Meeting
- Section 2 Aging Management Programs (AMP)
- Section 3 Aging Management Review (AMR) Results
- Attachment 1 Abbreviations and Acronyms
- Attachment 2 Project Team and Applicant Personnel
- Attachment 3 Elements of an Aging Management Program for License Renewal
- Attachment 4 Disposition of Requests for Additional Information, LRA Supplements, and Open Items
- Attachment 5 List of Documents Reviewed
- Attachment 6 List of Commitments

6.4.2 Safety Evaluation Report Input

Each project team member should prepare the SER input for the AMP and AMR audits and reviews that he or she performed. The technical assistance contractor will collect, assemble, and prepare the complete SER input.

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

- _ Assessments for each AMP that was determined to be consistent with the GALL Report
- _ Assessments for each AMP that was determined to be consistent with the GALL Report, which has exceptions or enhancements.
- _ Assessment of the operating experience associated with each AMP
- _ Assessment of the FSAR supplement associated with each AMP
- _ Assessment of AMR results that are consistent with the GALL Report
- _ Conclusions of the acceptability of AMPs and AMR results

The project team's SER input will provide information for the following SER sections. The project team will format its SER inputs to correspond to the following SER section numbers (3. through 3.X.3). The SER section numbers are not a continuation of the numbering convention used throughout this audit plan.

7. Aging Management Review Results

7.1. Applicant's Use of the Generic Aging Lessons Learned Report

7.1.1. Format of the LRA

7.1.2. Staff's Review Process

7.1.2.1. AMRs in the GALL Report

7.1.2.2. NRC-Approved Precedents

7.1.2.3. UFSAR Supplement

7.1.2.4. Documentation and Documents Reviewed

7.1.3. Aging Management Programs

7.1.3.1. AMPs that are Consistent with the GALL Report

7.1.3.2. AMPs that are Consistent with GALL Report With Exceptions or Enhancements

7.1.4. Quality Assurance Program Attributes Integral to Aging Management Programs

3.X.¹ Aging Management of _____

3.X.1. Summary of Technical Information in the Application

3.X.2. Staff Evaluation

3.X.2.1. AMR Results that are Consistent with the GALL Report

3.X.2.2. AMR Results that are Consistent with the GALL Report, for Which Further Evaluation is Recommended

¹ 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.2.3 AMR Results that are Not Consistent with or Not Addressed in the GALL Report

3.X.3 Conclusion

The project team will provide a discussion of its assessment of operating experience for each AMP that it evaluated. The project team will provide a discussion of its assessment of the FSAR supplement for each AMP that it evaluated.

The project team will document the applicant's amendments and supplements to the LRA by summarizing the issue that the amendment or supplement resolved and the project team's assessment and basis for resolving the issue. The project team will document the date and ADAMS accession number for each amendment or supplement.

The project team will document any requests for additional information (RAI) issued by the team, summarize the RAI, and identify the RAI number. The project team will document the applicant's response to the RAI by summarizing the response and the project team's assessment and basis for resolving the RAI. The project team will document the date and ADAMS accession number for each RAI response. The project team will identify unresolved RAIs as open items.

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 UFSAR supplement (Appendix A of the LRA) is acceptable. This SER input documents that the AMP is consistent with the GALL Report.

For AMPs determined to be consistent with the GALL Report, with exceptions or enhancement, 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 extended period of operation. The SER input should identify the exceptions and provide the basis for acceptance. The SER input will also address the UFSAR supplement, and document the basis for concluding that it is acceptable.

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

For AMR evaluations that are consistent with the GALL Report, and for which no further evaluation is recommended, the SER input should include the following:

- _ Identify the LRA section reviewed
- _ A summary of the type of information provided in the section of the LRA reviewed, including a listing of the AMPs reviewed.
- _ Identify the LRA Tables 3.X.2-Y reviewed.
- _ A summary review of the AMR Notes A through E used to classify the AMR line items used in these tables.
- _ 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.

- The bases for accepting any exceptions to GALL AMRs that were identified by the applicant or the project team member.
- A finding that the applicant identified the applicable aging effects
- A finding that the applicant defined the appropriate combination of materials and environments
- A finding that the applicant specified acceptable AMPs
- 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 extended period of operation, and that 10 CFR 54.21(a)(3) has been satisfied.

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

- The LRA section containing the applicant’s further evaluations of AMRs for which further evaluation is required.
- A list of the aging effects for which the further evaluations apply.
- For the applicant’s further evaluations, provide a summary of the basis for concluding that it satisfied the criteria of Section 3.X.3.2 of the SRP-LR (X=1, 2, 3, 4, 5, or 6 as applicable).
- A statement that the staff audited the applicant’s further evaluations against the criteria contained in Section 3.X.3.2 of the SRP-LR.
- A statement that the audit report contains additional information. Also identify the issue date and the ADAMS accession number for the audit report.

6.5 Documents Reviewed and Document Retention

The project team should document in Attachment 5 to the audit report any procedures, design basis documents, or engineering reports used to formulate the basis for its assessment of AMPs or AMRs. After the audit report is issued, the project team members should submit all worksheets generated during the audit to the project team leader.

After the renewed license is issued, the project team members should discard the documents collected or generated during the creation of the audit report and SER inputs. Examples of these documents are audit worksheets, questions, answers, issue tracking lists, and personal notes. Documents that are on the docket or are publicly available may be retained.

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.
	Parameters	Parameters monitored or inspected should be linked to the effects of

3	monitored or inspected	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 mitigating 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 extended period of 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 extended period of operation.

TABLE 2
STANDARD NOTES FOR LICENSE RENEWAL APPLICATION TABLES 3.X.2-Y

Note	Description
A	Consistent with NUREG-1801 [GALL Report] item for component, material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
B	Consistent with NUREG-1801 item for component, material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
C	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP is consistent with NUREG-1801 AMP.
D	Component is different, but consistent with NUREG-1801 item for material, environment, and aging effect. AMP takes some exceptions to NUREG-1801 AMP.
E	Consistent with NUREG-1801 for material, environment, and aging effect, but a different aging management program is credited.
F	Material not in NUREG-1801 for this component.
G	Environment not in NUREG-1801 for this component and material.
H	Aging effect not in NUREG-1801 for this component, material and environment combination.
I	Aging effect in NUREG-1801 for this component, material and environment combination is not applicable.
J	Neither the component nor the material and environment combination is evaluated in NUREG-1801.

APPENDIX A

PROJECT TEAM MEMBERS

Organization	Name	Function
NRC/NRR/DRIP/RLEP-B	N. Dudley	Team leader
NRC/NRR/DRIP/RLEP-B	P. Wen	Backup team leader
NRC/NRC/DRIP/RLEP-B	M. Lintz	Reviewer - Systems
NRC/NRC/DE/EEIB-B	J. Knox	Electrical
ATL International	B. Messitt	Contractor lead, Reviewer - Systems
ATL International	S. Traiforos	Reviewer - Structures
ATL International	C. Lapp	Reviewer - Mechanical
ATL International	W. Jackson	Reviewer - Materials

APPENDIX B

RLEP-B SCHEDULE FOR LRA SAFETY REVIEW

Plant: Monticello Nuclear Generating Plant
Project Team Leader: Noel Dudley
Backup Project Team Leader: Peter Wen
Project Manager: Daniel Merzke
Contractor: ATL

Activity/Milestone		Scheduled Completion
		2005
1	Receive license renewal application	03/31
2	Make review assignments (project manager)	05/15
3	Train project team	05/18
4	Hold project team planning (kick-off) meeting	05/19
5	Issue audit plan to project manager	05/18
6	Conduct first site visit (AMP reviews)	06/13-6/17
7	Draft AMP audit report input (team members)	06/24
8	Draft SER input for AMP reviews (team members)	08/22
9	Conduct in-office AMR reviews	06/27-07/08
10	Conduct second site visit (resolve AMP and AMR questions)	07/11-07/15
11	Draft AMR audit report input (team members)	08/05
12	Draft SER input for AMR reviews (team members)	08/22
13	Conduct third site visit (resolve outstanding issues and questions)	07/25-07/29
14	Conduct public exit meeting	08/05
15	Conduct writing session for audit report and SER input	N/A

16	Cutoff for providing RAIs to project manger	08/12
17	Final audit report (AMP and AMR sections)	09/21
18	Final input for draft SER with open items	09/21

APPENDIX C

AGING MANAGEMENT PROGRAM ASSIGNMENTS

MNGP LRA AMP Number	GALL Report AMP Number	Aging Management Program	Consistent W/ GALL?		Assigned Auditor
			Yes	Exception	
1.1.1	XI.S4	10 CFR Part 50, Appendix J	Yes	Exception	P. Wen
1.1.2	XI.M01	ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program	Yes	Exception	W. Jackson
1.1.3	XI.S3	ASME Section XI, Subsection IWF	Yes	Enhanced	W. Jackson
1.1.4	XI.M18	Bolting Integrity	Yes	Enhanced	NRC/NRR/DE
1.1.5	XI.M34	Buried Piping & Tanks Inspection	Yes	Enhanced	C. Lapp
1.1.6	Plant-	Bus Duct Inspection Program	No		J. Knox
1.1.7	XI.M06	BWR Control Rod Drive Return Line Nozzle	Yes	Exception	P. Wen
1.1.8	XI.M05	BWR Feedwater Nozzle	Yes	Enhanced	P. Wen
1.1.9	XI.M08	BWR Penetrations	Yes	Exception	W. Jackson
1.1.10	XI.M07	BWR Stress Corrosion Cracking	Yes	Exception	W. Jackson
1.1.11	XI.M04	BWR Vessel ID Attachment Weld	Yes	Exception	W. Jackson
1.1.12	XI.M09	BWR Vessel Internals	Yes	Exception Enhanced	W. Jackson
1.1.13	XI.M21	Closed-Cycle Cooling Water	Yes	Exception Enhanced	M. Lintz

MNGP LRA AMP Number	GALL Report AMP Number	Aging Management Program	Consistent W/ GALL?		Assigned Auditor
			Yes	Exception Enhanced	
1.14	XI.M24	Compressed Air Monitoring	Yes	Exception Enhanced	M. Lintz
1.15	XI.E01	Electrical Cables & Connectors Not Subject to 10 CFR 50.49 Environmental Qualification (EQ) Requirements	Yes	Consistent	
1.16	XI.E02	Electrical Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits	Yes	Exception	J. Knox
1.17	XI.M26	Fire Protection Program	Yes	Exception Enhanced	C. Lapp
1.18	XI.M27	Fire Water System Program	Yes	Enhanced	C. Lapp
1.19	XI.M17	Flow-Accelerated Corrosion	Yes	Consistent	P. Wen
1.20	XI.M30	Fuel Oil Chemistry	Yes	Exception Enhanced	B. Messitt
1.21	XI.E03	Inaccessible Medium Voltage (2kV to 34.5kV) Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements	Yes	Consistent	J. Knox
1.22	XI.M23	Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems	Yes	Exception Enhanced	B. Messitt
1.23	XI.M32	One-Time Inspection Program	Yes	Consistent	B. Messitt
1.24	XI.M20	Open-Cycle Cooling Water System Program	Yes	Consistent	M. Lintz
1.25	XI.M02	Plant Chemistry Program	Yes	Exception	C. Lapp
1.26	XI.S01	Primary Containment In-Service Inspection Program	Yes	Consistent	S. Traiforos
1.27	XI.S8	Protective Coating Monitoring and Maintenance	Yes	Enhanced	B. Messitt

MNGP LRA AMP Number	GALL Report AMP Number	Aging Management Program	Consistent W/ GALL?		Assigned Auditor
		Program			
1.28	XI.M03	Reactor Head Closure Studs	Yes	Consistent	
1.29	XI.M31	Reactor Vessel Surveillance	Yes	Enhanced	NRD/NRR/DE
1.30	XI.M33	Selective Leaching	Yes	Exception	S. Traiforos
1.31	XI.S05	Structures Monitoring Program	Yes	Enhanced	S. Traiforos
1.32	Plant-	Systems Condition Monitoring Program	No	Enhanced	NRC/NRR/DE
1.33	XI.M13	Thermal Aging and Neutron Irradiation Embrittlement of CASS Program	Yes	Consistent	P. Wen
3.2	X.M01	Metal Fatigue of Reactor Coolant Pressure Boundary TLAA	Yes	Enhanced	W. Jackson
3.1	X.E01	Environmental Qualification (EQ) Program - TLAA	Yes	Consistent	J. Knox
TIME-LIMITED AGING ANALYSES					
4.4	TLAA	Irradiation Assisted Stress Corrosion Cracking (IASCC)			M. Lintz
4.7	TLAA	Environmental Qualification of Electrical Equipment (EQ)			J. Knox

APPENDIX D

AGING MANAGEMENT REVIEW ASSIGNMENTS

Aging Management Reviews	Reviewer
3.1 Aging Management of Reactor Vessel, Internals, and Reactor Coolant System	W. Jackson
3.2 Aging Management of Engineered Safety Features	P. Wen/C. Lapp
3.3 Aging Management of Auxiliary Systems	B. Messitt
3.4 Aging Management of Steam and Power Conversion Systems	M. Lintz
3.5 Aging Management of Containment, Structures, and Component Supports	S. Traiforos
3.6 Aging Management of Electrical and Instrumentation and Controls	J. Knox

APPENDIX E

ACRONYMS AND ABBREVIATIONS

AC	Alternating Current
ACI	American Concrete Institute
ADAMS	Agency wide documents access and management system
ADS	Automatic Depressurization System
AERM	Aging Effects Requiring Management
AISC	American Institute of Steel Construction
AMP	Aging Management Program
AMR	Aging Management Review
ANSI	American National Standards Institute
API	American Petroleum Institute
APRM	Average Power Range Monitor
ARM	Area Radiation Monitor
ASCE	American Society of Civil Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATL	Advanced Technologies and Laboratories International, Inc.
ATWS	Anticipated Transient Without Scram
ATWS-RPT	Anticipated Transient Without Scram-Recirculation Pump Trip
BTP	Branch Technical Position
BWR	Boiling Water Reactor
BWROG	Boiling Water Reactor Owners Group
BWRVIP	Boiling Water Reactor Vessel and Internals Program
CAP	Corrective Action Program
CCW	Component Cooling Water/Closed Cooling Water
CDD	Condensate Deep Bed Demineralizer
DE	NRC/NRR/Division of Engineering
CFD	Condensate Filter Demineralizer
CHRS	Containment Heat Removal System
DIPM	NRC/NRR/Division of Inspection Program Management
CLB	Current Licensing Basis
CRD	Control Rod Drive
CRDH	Control Rod Drive Housing
CRDM	Control Rod Drive Mechanism
CS	Core Spray/Carbon Steel
CSCS	Core Standby Cooling System
CST	Condensate Storage Tank
CW	Circulating Water
CUF	Cumulative Usage Factor
DBA	Design Basis Accident
DBE	Design Basis Earthquake
DC	Direct Current
DG	Diesel Generator
DGB	Diesel Generator Building
D/P	Differential Pressure
DSCSS	Drywell and Suppression Chamber Spray System

DWT	Demineralized Water Tank
EAF	Environmentally Assisted Fatigue
E&RC	Environmental and Radiation Control
ECC	Emergency Core Cooling
ECCS	Emergency Core Cooling System
EFPY	Effective Full Power Years
EHC	Electro-Hydraulic Control
EPRI	Electric Power Research Institute
EPU	Extended Power Uprate
EQ	Environmental Qualification
ESF	Engineered Safety Features
FAC	Flow Accelerated Corrosion
FHA	Fire Hazards Analysis
FO	Fuel Oil
FOST	Fuel Oil Storage Tank
FP	Fire Protection
FPP	Fire Protection Program
FSAR	Final Safety Analysis Report
FW	Feedwater
GALL	Generic Aging Lessons Learned (the GALL Report is NUREG-1801)
GDC	General Design Criteria
GE	General Electric
GL	Generic Letter
GSI	Generic Safety Issue
HELB	High Energy Line Break
HEPA	High Efficiency Particulate Air
HPCI	High Pressure Coolant Injection
HPCS	High Pressure Core Spray (not an applicable system for MGNP)
HVAC	Heating, Ventilating, and Air Conditioning
IA	Instrument Air
IASCC	Irradiation Assisted Stress Corrosion Cracking
I&C	Instrumentation and Control
ID	Inside Diameter
IE	Inspection and Enforcement (former NRC Office of Inspection and Enforcement)
IEEE	Institute Of Electrical And Electronic Engineers
IGSCC	Intergranular Stress Corrosion Cracking
ILRT	Integrated Leak Rate Test (Containment Type A Test)
IN	Information Notice
INPO	Institute Of Nuclear Power Operations
IPA	Integrated Plant Assessment (10 CFR 54.21(a))
ISG	Interim (NRC) Staff Guidance
ISI	In-Service Inspection
KV	Kilovolt
LBB	Leak-Before-Break
LER	Licensee Event Report

LOCA	Loss of Coolant Accident
LPCI	Low Pressure Coolant Injection
LPCS	Low Pressure Core Spray
LR	License Renewal
LRA	License Renewal Application
MIC	Microbiologically Induced Corrosion
MNGP	Monticello Nuclear Generating Plant
MS	Main Steam
MSLB	Main Steam Line Break
MSR	Moisture Separator Reheater
MWTS	Makeup Water Treatment System
NDE	Nondestructive Examination
NDTT	Nil-Ductility Transition Temperature
NEI	Nuclear Energy Institute
NFPA	National Fire Protection Association
NMC	Nuclear Management Company
NPS	Nominal Pipe Size
NRC	Nuclear Regulatory Commission
NRR	NRC/Office of Nuclear Reactor Regulation
NSSS	Nuclear Steam Supply System
NUREG	Designation of publications prepared by the NRC staff
PASS	Post-Accident Sampling System
PCS	Primary Containment Structure
PFM	Probabilistic Fracture Mechanics
pH	Concentration of Hydrogen Ions
PM	Preventive Maintenance
PNS	Pneumatic Nitrogen System
PORV	Power-Operated Relief Valve
P-T	Pressure-Temperature
PTS	Pressurized Thermal Shock
PVC	Polyvinyl Chloride
PWS	Potable Water System
QA	Quality Assurance
RAI	Request for Additional Information
RBCCW	Reactor Building Closed Cooling Water
RCIC	Reactor Core Isolation Cooling
RCPB	Reactor Coolant Pressure Boundary
RFP	Reactor Feedwater Pump
RG	Regulatory Guide
RHR	Residual Heat Removal
RLEP-B	NRC/NRR/License Renewal and Environmental Impacts Program/Section B
RMS	Radiation Monitoring System
RPV	Reactor Pressure Vessel
RTNDT	Reference Temperature, Nil-Ductility Transition
RTNDT(U)	Reference Temperature, Nil-Ductility Transition (Unirradiated)
RVI	Reactor Vessel Internals
RWCU	Reactor Water Cleanup System

RXS	Reactor Building Sampling System
SA	Service Air
SAT	Startup Auxiliary Transformer
SBO	Station Blackout
SC	Structure/Component (10 CFR 54.21(a)(1)), also Suppression Chamber
SCC	Stress Corrosion Cracking
SCW	Screen Wash Water
SDV	Scram Discharge Volume
SER	Safety Evaluation Report
SFP	Spent Fuel Pool
SGTS	Standby Gas Treatment System
SI	Safety Injection
SLC	Standby Liquid Control
SR	Safety Related
SRP	Standard Review Plan
SRP-LR	Standard Review Plan for License Renewal
SRV	Safety Relief Valve
SS	Stainless Steel
SSC	Systems, Structures, and Components (10CFR 54.4(a))
SW	Service Water
TAC	Technical Assignment Control (internal NRC work management tool)
TB	Turbine Building
TBCCW	Turbine Building Closed Cooling Water
TGSCC	Trans-Granular Stress Corrosion Cracking
TLAA	Time-Limited Aging Analysis
UAT	Unit Auxiliary Transformer
UFSAR	Updated Final Safety Analysis Report
USE	Upper Shelf Energy
UUSE	Unirradiated Upper Shelf Energy
UT	Ultrasonic Test
VAC	Volts alternating current
VDC	Volts direct current