

April 21, 2009

Mr. Michael D. Wadley
Site Vice President
Prairie Island Nuclear Generating Plant,
Units 1 and 2
Northern States Power Company, Minnesota
1717 Wakonade Drive East
Welch, MN 55089

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2,
LICENSE RENEWAL SAFETY AUDIT REPORT (TAC NOS. MD8513 AND
MD8514)

Dear Mr. Wadley:

By letter dated April 11, 2008, Nuclear Management Company, LLC, now known as Northern States Power Company, submitted an application pursuant to Title 10 of the *Code of Federal Regulations* Part 54 (10 CFR Part 54) to renew the operating license for Prairie Island Nuclear Generating Plant, Units 1 and 2, for review by the U.S. Nuclear Regulatory Commission (NRC or the staff). On September 12, 2008, the NRC audit team completed the on-site audit of aging management programs. The audit report is enclosed.

If you have any questions, please contact me at 301-415-1427 or by e-mail at Richard.Plasse@nrc.gov.

Sincerely,

/RA/

Richard Plasse, Project Manager
Projects Branch 2
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket Nos. 50-282 and 50-306

Enclosure:
As stated

cc w/encl: See next page

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Northern States Power Company, Minnesota
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ADAMs Accession Number: **ML090850009**

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|--------|--------|-------------|-------------|
| OFFICE | LA:DLR | PM:RPB2:DLR | BC:RPB2:DLR |
| NAME | | RAPlasse | DWrona |
| DATE | 4/3/09 | 4/21/09 | 4/21/09 |

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Letter to M. Wadley from R. Plasse, dated April 21, 2009

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SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNITS 1 AND 2,
LICENSE RENEWAL SAFETY AUDIT REPORT (TAC NOS. MD8513 AND
MD8514)

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Prairie Island Nuclear Generating Plant,
Units 1 and 2

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U.S. NUCLEAR REGULATORY COMMISSION
OFFICE OF NUCLEAR REACTOR REGULATION - DIVISION OF LICENSE RENEWAL

Docket Nos: 50-282 and 50-306

License Nos: DPR-42 and DPR-60

Licensee: Northern States Power Company

Facility: Prairie Island Nuclear Generating Plant, Units 1 and 2

Location: 1717 Wakonade Drive East
Welch, MN 55089

Dates: September 8-12, 2008

Reviewers: R. Plasse, Project Manager, Division of License Renewal (DLR)
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Jerry Dozier, Chief
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Office of Nuclear Reactor Regulation

ENCLOSURE

Introduction

A five-day audit was conducted by the U.S. Nuclear Regulatory Commission (NRC) project team at the Prairie Island Nuclear Generating Plant, Units 1 and 2 (PINGP), in Welch, MN on September 8-12, 2008. The purpose of this audit was to examine the applicant's aging management programs (AMPs) documentation for PINGP, and to verify the applicant's claim of consistency with the corresponding Generic Aging Lessons Learned Report (GALL) AMPs. Exceptions to the GALL AMP elements will be evaluated separately as part of the NRC staff's (the staff) review of PINGP license renewal application (LRA) and documented in the staff's Safety Evaluation Report (SER).

"The Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants" (SRP-LR) (NUREG-1800), provides the staff guidance for reviewing an LRA. The Standard Review Plan allows an applicant to reference in its LRA the AMPs described in NUREG-1801, "Generic Aging Lessons Learned Report (GALL)." By referencing the GALL AMPs, the applicant concludes that its AMPs correspond to those AMPs which are reviewed and approved in the GALL Report, and that no further staff review is required. If an applicant credits an AMP for being consistent with a GALL Report program, it is incumbent on the applicant to ensure that the plant program contains all of the elements of the referenced GALL Report program. The applicant's determination should be documented in an auditable form and maintained on-site.

During this audit, the staff audited program elements 1-6, and program element 10, (operating experience), of the applicant's AMPs claimed to be consistent with the GALL report against the related elements of the associated AMP described in the GALL Report, unless otherwise indicated in this Audit Report. Elements 7-9 which address corrective actions, confirmation process, and administrative controls were audited by another NRC project team during the Scoping and Screening Methodology audit and are evaluated separately. The NRC project team audited 37 AMPs that the applicant stated were consistent with the GALL Report AMPs.

During this audit, if an applicant took credit for a program in the GALL Report, the staff verified that the plant program contains all the elements of the referenced GALL Report program. In addition, the staff verified the conditions at the plant were bounded by the conditions for which the GALL Report program was evaluated.

In performing this audit, the staff examined the applicant's program bases documents and related references for these AMPs. The NRC project team also interviewed PINGP representatives to obtain additional clarification related to the PINGP AMPs. This report documents the staff activities during this audit.

LRA AMP B2.1.1, 10 CFR Part 50, Appendix J Program

In the PINGP LRA, the applicant stated that PINGP AMP B2.1.1 is an existing program that is consistent with GALL AMP XI.S4, "10 CFR Part 50, Appendix J."

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the AMP elements are consistent with the elements in the GALL AMP XI.S4. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|--------------------------|---|-----------------|
| 1. LR-AMP-427 | License Renewal Aging Management Program Basis Document: 10 CFR Part 50, Appendix J Program | Rev. 2, 8/11/08 |
| 2. LER 2-89-003 | LER 2-89-003, Leakage Through Airlock Door Operating Seals | 11/22/89 |
| 3. PINGP H Procedure H19 | Containment Leakage Rate Testing Appendix C | Rev. 11, 6/6/07 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.1 are consistent with GALL AMP XI.S4 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP XI.S4. The staff also verified that the applicant provided an adequate summary description of the program.

The staff also reviewed the operating experience reports, including a sample of condition reports (CRs), and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The staff identified two issues where additional clarifications were needed related to the operating experience in the LRA. The first issue involved significant leakage through the Unit 2 maintenance airlock door operating shaft seals, which was found during a Type B test in 1989. The second issue was that the LRA contained no results for Type A, Type B, or Type C tests. The staff conducted a break-out meeting with applicant personnel to address these two concerns. The applicant said the first issue was resolved by replacing the airlock seals. The staff reviewed historic test data for that particular airlock, which verified the repair successfully addressed the leak. After the meeting, the applicant also provided historic test data for Type A, B and C tests. The staff's evaluation of these issues will be documented in the SER.

The 3 program elements, corrective actions, confirmation process, and administrative controls, were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.S4, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.2, Aboveground Steel Tanks Program

In the LRA, the applicant stated that AMP B2.1.2 is a new program that when implemented will be consistent with GALL AMP XI.M29, "Aboveground Steel Tanks."

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|------------------------|---|----------------------|
| 1. LR-AMP-437 | License Renewal AMP Basis Document – Above Ground Steel Tanks | Rev. 2, 9/2/08 |
| 2. D71.2 | Maintenance Procedures – General Painting of Plant Systems, Components and Piping | Rev. 7, 12/2/03 |
| 3. PM 3586-10 | Preventative Maintenance Procedures – Periodic Structures Inspection | Rev. 4, 7/18/07 |
| 4. CAP A/R 01069509 | Structural Inspection Findings | 12/29/06 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.2 are consistent with GALL AMP XI.M29 program. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP. The staff also verified that the applicant provided an adequate summary description of the program.

The staff noted that some tanks under the scope of this program are insulated. The applicant clarified for the staff that the 11 Condensate Storage Tank (153-091), 21 Condensate Storage Tank (253-091) and the 22 Condensate Storage Tank (253-092) are the only tanks in the scope of this program that are insulated. Where as the 11 Pre-coat Slurry Tank (153-291) and 21 Pre-coat Slurry Tank (253-291) are not insulated. However it was unclear to the staff what the inspection frequency will be for the inspections of the tank exteriors that require the removal the insulation. The staff will consider issuing a request for additional information (RAI) to address this discrepancy, and the staff's evaluation will be documented in the SER.

The staff noted that in the program element "monitoring and trending," that the applicant states that inspections of the exterior surface will be performed at least once per refueling cycle, which is consistent with the GALL Report recommendations, however the applicant also states that the inspection scope and frequency will be adjusted based on the results of previous inspections and operating experience. It was unclear to the staff what the inspection frequency will be for the inaccessible surfaces (tank bottoms). The staff will consider issuing an RAI to address this discrepancy, and the staff's evaluation will be documented in the SER.

The staff audited the "operating experience" element for the Aboveground Steel Tanks Program and associated CRs that were provided in the plant basis documents and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In its review of the applicant's operating experience the staff noted that during a periodic structures inspection the applicant detected

corrosion on the covering of the insulation and coating degradation on the hatch covers, all of which were on the exterior surface of the Condensate Storage Tanks. As a result of the inspection findings the applicant entered this into their corrective action program (CAP) and action reports and work requests have been issued to address these issues. The staff noted that the applicant was able to detect degradation before loss of intended function and has taken appropriate steps to have the degradation repaired and the work is currently in the planning stages, as part of PINGP's CAP.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M29, except for the areas that the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.3, ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program

In the PINGP LRA, the applicant stated that AMP B2.1.3 is an existing program that is consistent with the program elements in GALL AMP XI.M1, "ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD."

During its audit, the staff reviewed the applicant's on-site documentation to determine whether those program elements claimed to be consistent with the GALL Report in the applicant's AMP, are consistent with the program elements recommended in GALL AMP XI.M1. The staff interviewed the applicant's technical staff and reviewed the following additional on-site documents listed below.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|-----------------|---|------------------|
| 1. LR-AMP-403 | Prairie Island Nuclear Generating Plant License Renewal Aging Management Program Basis Document ASME Section XI Inservice Inspection, Subsections IWB, IWC, and IWD Program | Rev. 2, 08/21/08 |
| 2. H10.5 | 4th Interval Inservice Inspection Plan – Units 1 & 2, December 21, 2004 Through December 20, 2014 | Rev. 3 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.3 are consistent with GALL AMP XI.M1 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in GALL AMP XI.M1. The staff also verified that the applicant provided an adequate summary description of the program.

The staff noted that the applicant, in LRA Appendix B section B2.1.3, describes the present approved PINGP Inservice Inspection (ISI) program for the fourth ISI interval. Specified limitations, modifications and NRC-approved alternatives described in Appendix B section B2.1.3 only apply to the fourth ISI interval. However, it is not stated how the PINGP ISI Program will be implemented in the period of extended operation. The staff will consider issuing an RAI to address this issue.

The staff also audited the operating experience reports, including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M1 not including any areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.4, ASME Section XI, Subsection IWE Program

In the PINGP LRA, the applicant stated that PINGP AMP B2.1.4 is an existing program that is consistent with GALL AMP XI.S1, "ASME Section XI, Subsection IWE."

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the AMP elements are consistent with the elements in GALL AMP XI.S1. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|--|---|-----------------|
| 1. LR-AMP-425 | License Renewal Aging Management Program Basis Document: ASME Section XI, Subsection IWF Program | Rev. 2, 8/21/08 |
| 2. IN 89079 | Degraded Coatings and Corrosion of Steel Containment Vessels | Rev. 1, 12/2/89 |
| 3. CAP 033171 | Unit 2 Containment Coating Damage | 10/01/03 |
| 4. CAP 039736 | Unit 1 Containment Penetration 1 | 11/8/04 |
| 5. L-PI-05-073 NRC ADAMS Accession #: ML052440054 | Nuclear Management Company Response to Generic Letter 2004-02, "Potential Impact of Debris Blockage on Emergency Recirculation During Design Basis Accidents at PWRs" for the Prairie Island Nuclear Generating Plant | 8/31/05 |
| 6. PINGP SP 1834 | PINGP Surveillance Procedure "Unit 1 Containment Coating Inspection" | Rev. 4, 5/27/08 |
| 7. Draft Amendment L-PI-07-023 | Draft Amendment to 2R24 90 Day ISI Summary Report | Draft 9/9/08 |
| 8. NRC ADAMS Accession #: ML061560052 | Summary of the License Renewal Telephone Conference Call and Meeting Held Between the US NRC Staff and the NEI License Renewal Task Force | 6/2/06 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.4 are consistent with GALL AMP XI.S1 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in GALL AMP XI.S1. The staff also verified that the applicant provided an adequate summary description of the program.

In comparing the elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.4 are consistent with GALL AMP XI.S1 program elements except for the areas that the staff needed additional information as discussed below. During its review, the staff found that the PINGP ASME Section XI, Subsection IWE Program inspection and acceptance criteria for the current 10-year inspection interval comply with ASME Section XI, 1992 Edition including 1992 Addenda, while the GALL Report recommends the 2001 edition including the 2002 and 2003 Addenda. This difference is acceptable per 10 CFR 50.55a and is documented in a conference call summary between the Nuclear Energy Institute (NEI)

and NRC (Document number 8 above). The applicant stated the next 10-year inspection interval will adopt the new ASME Code editions and addenda, which is consistent with the provisions of 10 CFR 50.55a.

The staff also reviewed the operating experience reports, including some CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The review indicated several instances of minor coating degradation within containment as well as an ongoing issue with water seepage from the refueling cavity into containment sumps. Currently the seepage issue is tracked under the Structures Monitoring Program, but also applies to the ASME Section XI, Subsection IWE Program due to the possibility of borated water coming into contact with the containment vessel. The staff conducted a break-out meeting where applicant personnel explained that PINGP does not credit coatings for aging management and provided documentation of how the plant solves the issue of containment recirculation and possible sump blockage due to coating degradation. The staff will consider issuing RAIs to further address these issues. The seepage issue will be tracked under the Structures Monitoring Program AMP but may affect the ASME Section XI, Subsection IWE Program if the seepage is believed to affect or degrade the containment vessel.

The 3 program elements, corrective actions, confirmation process, and administrative controls, were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.S1, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.5, ASME Section XI, Subsection IWF Program

In the PINGP LRA, the applicant stated that PINGP AMP B.2.1.5 is an existing program that is consistent with GALL AMP XI.S3, "ASME Section XI, Subsection IWF."

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the AMP elements are consistent with the elements in GALL AMP XI.S3. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION /DATE |
|--|---|-----------------|
| 1. LR-AMP-426 | License Renewal Aging Management Program Basis Document: ASME Section XI, Subsection IWF Program | Rev. 2, 7/28/08 |
| 2. NRC ADAMS Accession Number: ML061560052 | Summary of the License Renewal Telephone Conference Call and Meeting Held Between the US NRC Staff and the NEI License Renewal Task Force | 6/2/06 |
| 3. PINGP CAP039351 | Support Not Providing its Design Function | 10/18/04 |
| 4. NMC Fleet Procedure FP-PE- NDE-530 | Visual Examination, VT-3 | Rev. 1, 1/11/08 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.5 are consistent with GALL AMP XI.S3 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP XI.S3. The staff also verified that the applicant provided an adequate summary description of the program.

In comparing the elements in the applicant's program to those in GALL AMP XI.S3, the staff found the PINGP ASME Section XI, Subsection IWF Program plan for the current 10-year inspection interval is based on ASME Section XI, 1998 Edition including 1999 and 2000 Addenda, while the GALL Report recommends the 2001 edition including the 2002 and 2003 Addenda. This difference is acceptable per 10 CFR 50.55a and is documented in a conference call summary between the NEI and NRC (Document number 2 above). The applicant stated the next 10-year inspection interval will adopt the new ASME Code editions and addenda, which is consistent with the provisions of 10 CFR 50.55a. The PINGP program basis documents mention that the program "also includes inspections of concrete and grouting for component support building structure attachments." The applicant explained that this only relates to localized areas where the support is anchored; a different program (Structures Monitoring Program) is responsible for inspecting concrete in general. This was verified in the site procedures.

The staff also reviewed the operating experience reports, including some CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The operating experience of the

ASME Section XI, Subsection IWF Program provided by the applicant did not show any adverse trends in performance. The applicant confirmed that problems identified would not cause significant impact to the safe operation of the plant, and adequate corrective actions were taken to prevent recurrence.

The 3 program elements, corrective actions, confirmation process, and administrative controls, were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.S3.

LRA AMP B.2.1.6, Bolting Integrity Program

In the PINGP LRA, the applicant stated that PINGP AMP B.2.1.6 is an existing program that is consistent with GALL AMP XI.M18, "Bolting Integrity," with an enhancement and exception. The exception is related to the inspection technique for high strength structural bolts, and the enhancement is related to the modification of the supplemental AMPs to accurately depict the inspection requirements for bolting.

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents:

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|---------------------|---|-------------------|
| 1. LR-AMP-408 | Bolting Integrity Program | Rev. 2, 9/2/08 |
| 2. D63 | Installation Guidelines for Threaded Fasteners (Studs or Bolts) | Rev. 18, 12/26/07 |
| 3. PINGP EM 2.1.1 | Structural Bolting/Torquing | Rev. 2, 11/17/06 |
| 4. PINGP EM 2.2.6 | Mechanical Bolting/Torquing | Rev. 1, 1/26/00 |
| 5. PINGP EM 3.2.1.4 | Specification for Piping Materials | Rev. 8, 6/27/08 |
| 6. CAP 845596 | CS Pump Support Bolting has Improper Thread Engagement | 5/15/05 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B.2.1.6 are consistent with GALL AMP XI.M18 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP except for the areas that the applicant took exceptions to GALL AMP XI.M18. The staff also verified that the applicant provided an adequate summary description of the program.

The staff found that the GALL Report "monitoring and trending" program element which recommends leak rate to be monitored on a particularly defined schedule, was not properly documented in PINGP's Bolting Integrity Program. The staff also found that in the Bolting Integrity Program description, the applicant identifies several reference documents in addition to the GALL Report approved guidance documents. The use of 2 sets of guidance brings into question whether or not there are contradictions which would lead the applicant to use a requirement less restrictive than what is recommended in the GALL Report. Additionally, the staff found that the enhancement taken would need additional clarification explaining the actual items to be modified. Finally, the staff found several instances in the applicant's documentation where incorrect statements could be interpreted as a complete misunderstanding of the Bolting Integrity Program. The staff will consider issuing RAIs to address these issues, and the staff's evaluation will be documented in the SER.

The staff also reviewed the operating experience reports, including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience

did not reveal any degradation not bounded by industry experience. A CR indicated that in 2005, improper thread engagement was discovered on the containment spray pump. The staff found that proper corrective actions were taken to address the issue as well as proper follow up inspections on the pump.

The 3 program elements, corrective actions, confirmation process, and administrative controls, were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M18, not including any exceptions identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER and the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.7, Boric Acid Corrosion Program

In the LRA, the applicant stated that AMP B2.1.7 is an existing program that is consistent with GALL AMP XI.M10, "Boric Acid Corrosion."

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|------------------------|---|----------------------|
| 1. LR-AMP-405 | LR AMP Basis Document – Boric Acid Corrosion Program | Rev. 2, 8/15/08 |
| 2. H2 | Boric Acid Corrosion Program | Rev. 13, 3/21/08 |
| 3. | Applicant response NRC Bulletin 2002-01 – 60 day response | 5/17/02 |
| 4. L-PI-03-007 | Applicant response NRC Bulletin 2002-01 RAIs | 1/20/03 |
| 5. L-02-095 | Applicant response NRC Bulletin 2002-02 | 9/11/02 |
| 6. L-PI-03-084 | Applicant response to NRC Bulletin 2003-002 | 9/19/03 |
| 7. Unit 1 Cycle 22 | Inservice Inspection summary reports | |
| 8. CAP032754 | Boric acid leak at body-to-bonnet joint | 9/20/03 |
| 9. CAP038376 | Boric acid leak found on 1PT729 during BACC walkdown | 9/11/04 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.7 are consistent with GALL AMP XI.M10 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP XI.M10. The staff also verified that the applicant provided an adequate summary description of the program.

In comparing the elements in the applicant's AMP to those in GALL AMP XI.M10, the staff found that the applicant has identified all the systems and components included in the scope of the Boric Acid Corrosion Program, including class 1 nickel alloy components such as reactor pressure vessel (RPV) closure head bare metal inspection, RPV bottom head bare metal inspection, and ultra testing (UT) examination, with insulation removed, of pressurizer surge nozzle to safe end Alloy 600 weld. The staff also reviewed the applicant's responses to various NRC Bulletins on RPV upper head and lower head inspections.

The staff audited the operating experience reports, including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. A number of Inservice Inspection Summary Reports identified borated water leakage through carbon steel bolts and nuts and through valve packings.

In the operating experience element of LRA Section B2.1.7, the LRA states that PINGP found borated water leakage and boric acid crystal accumulations. The staff will consider issuing an RAI to ask the applicant to provide some specific examples of issues that were found in the

CRs, especially since PINGP has experienced significant issues with leakages from valve packings, and bolts and nuts.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M10, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.8, Buried Piping and Tanks Inspection Program

In the PINGP LRA, the applicant stated that LRA AMP B2.1.8 is a new program that will be consistent with GALL AMP XI.M34, "Buried Piping and Tanks Inspection."

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL report. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|--|--|----------------------|
| 1. LR-AMP-420 | Prairie Island Nuclear Generating Plant, License Renewal Aging Management Program Basis Document, Buried Piping and Tanks Inspection Program | Rev. 2, 7/17/08 |
| 2. Fluor Pioneer Incorporated, Specification 106 (SS – M 433), | Standard Specification - Protective Coating for Steel Pipe | 10/10/74 |
| 3. PINGP Drawing NF-39287-4 | Fuel Oil Yard Piping and Filter House | Rev. L |
| 4. PINGP Drawing X-HIAW-106-174 | Component Cooling Water Return Elev. 695'-0" Unit 1 | Rev. B |
| 5. PINGP Drawing NF-39262-2 | Yard Piping | Rev. L |
| 6. PINGP Drawing NF-39256-1 | Yard Fire Protection Piping | Rev. AG |
| 7. PINGP Drawing X-HIAW-64-1 | 19500 Gallon Underground Tank | Rev. B |
| 8. PINGP Drawing X-HIAW-64-2 | 35000 Gallon Underground Tank | Rev. B |
| 9. PINGP Drawing X-HIAW-64-3 | Tank Ladder | Rev. 1 |
| 10. PINGP Drawing X-HIAW-64-4 | 40000 Gallon Underground Oil Storage Tank | Rev. B |
| 11. PINGP Drawing X-HIAW-64-5 | Tank Ladder | Rev. 0 |
| 12. PINGP Drawing NF-38607-1 | Circulating Water System, Emergency Cooling Water Intake Pipe Plan & Profile | Rev. M |
| 13. L-PI-08-033 | 2007 Annual Radiological Environmental Monitoring Program (REMP) Report | 5/13/08 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.8 are consistent with GALL AMP XI.M34

program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP except for the areas that the applicant took exceptions to GALL AMP XI.M34. The staff also verified that the applicant provided an adequate summary description of the program.

The staff noted that:

1. the pH of the ground water/soil is in the range of 7.7 which provides a relatively non-aggressive environment for general, pitting, and crevice corrosion of steel components.
2. the applicant committed to perform opportunistic or focused excavations of buried piping and tanks to visually inspect components for loss of coating and wrapping integrity and steel corrosion before the end of the current license period and during each ten-year period of the period of extended operation.
3. piping and tank external coatings and wrappings were applied in accordance with appropriate industry standards.

During discussion between the staff and the applicant it was revealed to the staff that high tritium levels were discovered in on-site and off-site groundwater during the early days of plant operation. The staff will consider issuing an RAI to ask the applicant:

1. to identify the cause of the elevated tritium and actions taken to reduce tritium levels.
2. if there are any systems subjected to the Buried Piping and Tanks Inspection Program that contain or could contain radioactive material that could be released to the groundwater if piping or tanks leak.
3. to provide the details of all leak instances associated with systems subjected to the Buried Piping and Tanks Inspection Program and an assessment of the impact of such leaking on groundwater contamination.

In LRA AMP B2.1.8 the applicant stated that portions of buried coated carbon steel piping of the Cooling Water and Fire Protection Systems have been replaced as a result of micro-biologically influenced corrosion (MIC) indications on the piping inside diameter. It is not clear what replacement material(s) were used or if coatings or wrappings were used. The staff will consider issuing an RAI for the applicant to provide this information.

In LRA AMP B2.1.8 the applicant stated that opportunistic or focused excavations and subsequent visual inspections will be performed on buried piping and tanks but does not identify how locations will be identified for inspection. The staff will consider issuing an RAI to ask how locations will be identified for excavation and inspection and if degradation is found during inspection, how the inspection scope will be expanded.

In its review of the program basis document, the staff noted that the applicant takes no credit for cathodic protection to manage loss of material for buried piping and tanks. The staff will consider issuing an RAI to ask if cathodic protection is used at PINGP for buried piping and tanks, and if so why no credit is taken for managing loss of material by this mitigative technique? The response to the RAIs will be evaluated in the SER.

The staff also audited the operating experience reports and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process, and administrative controls, were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M34, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.9, Closed-Cycle Cooling Water System Program

In the LRA, the applicant states that AMP B2.1.9 is an existing program that, following an enhancement, will be consistent with GALL AMP XI.M21, "Closed-Cycle Cooling Water System," with exceptions.

During its audit, the staff reviewed on-site documentation supporting the applicant's conclusion that program elements in the applicant's AMP are consistent with program elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|------------------|--|------------------|
| 1. LR-AMP-411 | License Renewal AMP Basis Document – Closed-Cooling Water System Program | Rev. 2, 8/20/08 |
| 2. 5AWI 11.1.0 | Chemistry Department Program | Rev. 6, 3/12/08 |
| 3. RPIP 3106 | Sampling Techniques | Rev. 13, 7/14/05 |
| 4. RPIP 3101 | Chemistry Sampling Frequencies and Limits | Rev. 31, 11/1/05 |
| 5. RPIP 3681 | Corrosion Inhibitor Sampling and Chemical Addition | Rev. 4, 8/23/05 |
| 6. RPIP 3550 | Microbiological Testing | Rev. 6, 4/21/06 |
| 7. RPIP 3050 | Corrosion Monitoring and Control Program | Rev. 11, 6/10/08 |
| 8. C39.5 | Corrosion Monitoring | Rev. 4, 8/10/05 |
| 9. PM 3001-2-D1 | D1 Diesel Generator Inspection (034-011) | Rev. 23, 4/25/07 |
| 10. Report | Operating Experience Data Collection Report for Closed-Cycle Cooling Water System | 2/19/08 |
| 11. AR# 00762360 | "11 CC HX" Relief Valve Appears to Have Rust Inside | 10/8/04 |
| 12. AR# 0035345 | Turbine Building Heating System Has High pH | 2/13/04 |
| 13. AR# 0034782 | HS-159-1 Developed a Glycol Leak from Valve Body | 1/6/04 |
| 14. SA038104 | PINGP Chemistry Focused Self-Assessment Closed cooling Water Guidelines | 5/18-20/05 |
| 15. EEC 1485 | Install Continuous Vent Lines on Hot Water Converters in Auxiliary and Turbine Building Heating System | 5/21/04 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.9 are consistent with GALL AMP XI.M21 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP except for the areas that the applicant took exceptions to GALL AMP XI.M21. The staff also verified that the applicant provided an adequate summary description of the program.

The staff noted that the applicant has committed to implement an enhancement affecting the "monitoring and trending" program element. The enhancement will change the program to include visual examination of accessible surfaces of components serviced by closed-cycle

cooling water when the systems or components are opened during scheduled maintenance or surveillance activities.

The applicant took an exception to the “preventive actions” program element; the applicant implements the guidance in Electric Power Research Institute (EPRI) TR-107396, Revision 1, “Closed Cooling Water Chemistry Guidelines,” April 2004, in lieu of EPRI TR-107396, Revision 0, “Closed Cooling Water Chemistry Guidelines,” October 1997. The applicant also took an exception to the “parameters monitored/inspected” program element; some of the pump and heat exchanger performance parameters recommended by the GALL Report are not used by the applicant for monitoring specific pumps or smaller converters serviced by the closed-cycle cooling water systems; and, the applicant states that that chemical controls and established performance monitoring techniques, based on plant experience, are adequate to detect changes in system performance due to corrosion or cracking. The staff will consider issuing an RAI to address these issues, and the staff’s evaluation will be documented in the SER.

The staff reviewed the applicant’s procedure related to monitoring and control of corrosion inhibitors, comparing the applicant’s monitoring frequencies and limits against those recommended in EPRI guidelines used by the applicant. The staff noted no differences between recommendations in the EPRI guidelines and the applicant’s procedure. Except for the enhancement and exceptions identified by the applicant, the staff did not identify any differences between the applicant’s claims of consistency with the GALL Report and program elements as recommended in the GALL Report for AMP XI.M21.

The staff also audited the applicant’s operating experience reports, including a sample of CRs, and interviewed the applicant’s technical staff to confirm that plant-specific operating experience does not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared the other 7 program elements in the applicant’s program and verified that these 7 elements for the AMP are consistent with those recommended in GALL AMP XI.M21, not including any exceptions identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER, and the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.10, Compressed Air Monitoring Program

In the LRA, the applicant stated that AMP B2.1.10 is an existing program that is consistent with GALL AMP XI.M24, "Compressed Air Monitoring," with enhancements and an exception.

During its audit, the staff reviewed the applicant's on-site documentation to support its conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|------------------------|--|----------------------|
| 1. LR-AMP-413 | LR AMP Program Basis Document – Compressed Air Monitoring | Rev. 2, 7/14/08 |
| 2. ISA-7.0.01-1996 | Quality Standard for Instrument Air | 11/12/96 |
| 3. C34 | Operating Procedure, Station Air System | Rev. 34 |
| 4. C34 AOP 1 | Loss of Instrument Air | Rev. 15 |
| 5. PM 3510-1-121 | 121 Instrument Air Dryer Annual inspection | Rev. 14 |
| 6. SP 1298 | Pressurizer PORV Air Accumulator Check valve Leak Test | Rev. 10 |
| 7. TP 1805 | Instrument Air System Joint Integrity Test | Rev. 3 |
| 8. GMP INGE-002 | Ingersoll Rand Instrument/Station Air Compressors 1000 Hour Inspection | Rev. 0 |
| 9. PM 3505-2-121 | 121 Instrument Air Compressor 4000 Hour inspection | Rev. 16 |
| 10. PM-3505 | Instrument Air System Dew Point Test | Rev. 10 |
| 11. AR01103444 | 121 Moisture Separator has low UT thickness Results | 7/25/07 |
| 12. AR01003810 | SA particulate weight gain Exceeded procedure requirements | 11/15/05 |
| 13. SWI-GSE-27 | Conduct of System Engineering | Rev. 7 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.10 are consistent with GALL AMP XI.M24 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP except for the areas that the applicant took exceptions to GALL AMP XI.M24. The staff also verified that the applicant provided an adequate summary description of the program.

PINGP is taking an exception to performance testing guidelines provided in ASME OM-S/G-1998, Part 17 and EPRI TR-108147. The staff will evaluate this exception in the SER.

In comparing the elements in the applicant's AMP to the GALL Report, the staff found that the applicant has taken enhancements as follows:

1. The Compressed Air Monitoring Program will be enhanced to include monitoring and maintenance of air quality in accordance with the guidance provided in ANSI/ISA-S7.0.01-1996. Particulate testing will be revised to use particulate size methodology as specified in ISA S7.0.01.

2. The Compressed Air Monitoring program will be enhanced to include air sampling activities on a representative sampling of headers on a yearly basis in accordance with ASME OM-S/G-1998, Part 17 and EPRI TR-108147.

The staff also audited the operating experience reports including a sample of CRs and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. AR 01103444 and AR 01003810 were reviewed to verify effectiveness of the program.

In the operating experience element of LRA Section B2.1.10, the LRA states that PINGP found concerns with compressor and dryer reliability that resulted in increased monitoring and plans for equipment replacement. There was no specific plant operating experience provided. The staff will consider issuing an RAI to address this issue.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M24 with enhancements, not including any exceptions identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER, and the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.12, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program

In the PINGP LRA, the applicant stated that PINGP AMP B2.1.12 is a new program that is consistent with GALL AMP XI.E1, "Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements."

During its audit, the staff reviewed the applicant's on-site documentation to support its conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|----------------------------|--|-----------------|
| 1. LR-AMP-430 | Program Basis Document | Rev. 2, 8/17/08 |
| 2. LR-AMR-339 | License Renewal Aging Management Review Report – Electrical Commodities | Rev. 2, 8/28/08 |
| 3. CR 200201427 | During de-term of 21 RCP motor, found jacket over individual conductors to be degraded/damaged | 2/12/02 |
| 4. EPRI NP-7485 | Power Plant Practices to Ensure cable Operability | July 1992 |
| 5. EPRI TR-1003317 | Cable System Aging Management | April 2002 |
| 6. EPRI TR-1013475 | License Renewal Electrical Handbook | February 2007 |
| 7. IEEE Standard 1205-2000 | IEEE guide for Assessing, Monitoring, and Mitigating Effects on Class 1E Equipment Used in Nuclear Power Generating Stations | |
| 8. NUREG/CR-5643 | Insights Gained From Aging Research, U.S. Nuclear Regulatory Commission | March 1992 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.12 are consistent with GALL AMP XI.E1 program elements. The staff confirmed that the boundary conditions of the plant program envelopes the boundary conditions described in the GALL AMP. The staff did not find an adequate definition for adverse localized environment, which should be based on the most limiting design by cable type. During discussion with applicant personnel, temperature and radiation threshold for each cable material was presented to the staff. The staff reviewed and confirmed the data to be adequate.

In the plant basis document, the staff noted plant specific operating experience has shown that adverse localized environments for electrical cables and connections have been suspected to cause localized cable and connection insulation degradation at PINGP. Most cases were not clearly defined as to differentiate insulation degradation from cable jacket degradation. All noted degradation cases resulted in the replacement or rework of the affected cable or connection jacket/insulation.

The staff also reviewed the operating experience reports including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience

did not reveal any degradation not bounded by industry experience. In 2002, the 21 reactor coolant pump (RCP) power cables insulation observed to be cracked inside unit 2 while at cold shutdown. The applicant subsequently consulted with the cable manufacturer (Kerite) to properly take action to adequately address this issue.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.E1.

LRA AMP B2.1.13, Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits Program

In the PINGP LRA, the applicant stated that PINGP AMP B2.1.13 is a new program that is consistent with GALL AMP XI.E2, "Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits."

During its audit, the staff reviewed the applicant's on-site documentation to support its conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|----------------------------|--|------------------|
| 1. LR-AMP-431 | Program Basis Document | Rev. 2, 08/15/08 |
| 2. LR-AMR-339 | License Renewal Aging Management Review Report – Electrical Commodities | Rev. 2, 8/28/08 |
| 3. WO-0201741 | "Source Range Noise Reduction/Remove TMod 02T121" | 9/12/03 |
| 4. WO-0007781 | 1RM-12 Spiking | 9/22/00 |
| 5. CR 200201534 | Source Range 2N31 Failed During Refueling Outage High indication (10^4 cps) due to suspected noise | 2/14/02 |
| 6. EPRI TR-109619 | Guideline for the Management of Adverse Localized Environments | June 1999 |
| 7. IEEE Standard 1205-2000 | IEEE guide for Assessing, Monitoring, and Mitigating Effects on Class 1E Equipment Used in Nuclear Power Generating Stations | |
| 8. NUREG/CR-5643 | Insights Gained From Aging Research, U.S. Nuclear Regulatory Commission | March 1992 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.13 are consistent with GALL AMP XI.E2 program elements. The staff confirmed that the boundary conditions of the plant program envelopes the boundary conditions described in the GALL AMP.

Instrumentation circuits in this program that are sensitive to reduction in conductor insulation resistance will be periodically tested such as insulation resistance tests, time domain reflectometry tests, or other tests effective in determining cable insulation condition. Surveillance data will be reviewed at least once every ten years, to provide an indication of the condition of the insulated conductor and connection, and the ability of the circuit to perform its intended function throughout the period of extended operation.

The staff also reviewed the operating experience reports including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In 2002, a source range channel failed during the refueling outage prior to fuel movement. The apparent cause was

noise on the channel giving readings greater than 10^4 counts per second (cps). Corrective action was taken to address the issue.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.E2.

LRA AMP B.2.1.14, External Surface Monitoring Program

In the LRA, the applicant stated that AMP B2.1.14 is an existing program that when implemented will be consistent with GALL AMP XI.M36, "External Surface Monitoring," with enhancements.

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|------------------------|---|----------------------|
| 1. LR-AMP-422 | License Renewal AMP Basis Document – External Surfaces Monitoring | Rev. 2, 8/28/08 |
| 2. CD 5.28 | Conduct of System Engineering | Rev. 4, 4/2/07 |
| 3. SWI GSE-27 | Section Work Instruction – Conduct of System Engineering | Rev. 6, 1/18/08 |
| 4. PINGP 1516 | Walkdown Checklist – Mechanical Systems/Components | Rev. 1 |
| 5. CAP042287 | Corrosion on FCU Flange | 5/10/05 |
| 6. CAP01048672 | Boric Acid Leak on CV-31213 | 1/16/07 |
| 7. CAP01055912 | D5 Fuel Pump Isolation Valve 2EG-9-16 Leak | 12/26/06 |
| 8. CAP0111642 | D5/D6 Fuel Oil Piping and Supports are Rusty | 9/13/01 |
| 9. W/O | Work Order – Minor D5 fuel oil leaks, 2EG-9-16 and 2EG-9-23 | 11/13/06 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.14 are consistent with GALL AMP XI.M36 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP. The staff also verified that the applicant provided an adequate summary description of the program.

During the audit of the applicant's program basis document the staff noted that the applicant expanded the scope of materials and aging effects for this program beyond the recommendations of GALL XI.M36. The staff also noted that the applicant did not state that the expansion in the scope of aging effects and materials was an exception to the recommendations to GALL XI.M36. The staff will consider issuing two separate RAIs to address this issue, and the staff's evaluation will be documented in the SER.

The staff audited the "operating experience" element for the External Surfaces Monitoring Program and associated CRs that were provided in the plant basis documents and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. During its review the staff noted that the fan coil unit (FCU) supply/return flanges were corroded. The applicant identified the corrosion and then performed an evaluation to either replace or resurface the flange. The applicant later found several other flanges with similar conditions. Based on the evaluation, the applicant subsequently repaired these flanges by machining them. The applicant noted that

there was a boric acid leakage on control valve CV-31213, and the applicant initiated corrective actions. It was later determined by the applicant that the boric acid was located on stainless steel materials, which are resistant to boric acid corrosion. The applicant subsequently repaired the leak and cleaned the residual dry boric acid from the surface. The applicant noted that during a surveillance test (diesel generator monthly slow start) on October 2006, there was a leak at the fuel pump isolation valve, 2EG-9-16. The applicant's evaluation noted that this type of leak may put them in an unplanned limiting condition for operation. The applicant initiated corrective actions to have the leak repaired by the "Fix It Now" team in November 2006. The staff noted that in each of the cases of operating experience the staff reviewed, the applicant was able to detect degradation and then initiate corrective actions to resolve the issue.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the Aging Management Program audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M36, except for the areas that the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.15, Fire Protection Program

In the LRA, the applicant stated that AMP B2.1.15 is an existing program that is consistent after enhancements with GALL AMP XI.M26, "Fire Protection," with an exception.

During its audit the staff reviewed the applicant's on-site documentation to support its conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|-------------------|---|------------------|
| 1. LR-AMP-414 | LR AMP Basis Document – Fire Protection Program | Rev.2, 09/02/08 |
| 2. F5 Appendix K | Fire Protection Systems Operability Requirements | 10/12/07 |
| 3. SP 1192 | Safeguards Electrical and Mechanical Penetrations Surveillance Inspection | Rev. 7/8/08 |
| 4. SP 1053 | Fire Protection Pumps Monthly Test | Rev. 40, 3/5/08 |
| 5. SP 1524 | 122 diesel fire pump weekly test | Rev. 35, 3/14/08 |
| 6. SP 1194 | Cardox 18 month system test | Rev. 16, 6/18/07 |
| 7. SP 1492 | Halon cylinder Check | Rev. 0, 2/12/03 |
| 8. SP 1266 | Fire Damper – 18 month inspection | Rev. 15, 6/30/08 |
| 9.PM 3122-4 | Fire and Security Door Mechanical Inspection | Rev. 13, 12/9/07 |
| 10. CAP 037332 | Fire pump strainer not working | 6/29/04 |
| 11. CAP 200201338 | Fire door not closing properly | |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.15 are consistent with GALL AMP XI.M26 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP except for the areas that the applicant took exception to GALL AMP XI.M26. The staff also verified that the applicant provided an adequate summary description of the program.

In comparing the elements in the applicant's AMP, the staff found that the applicant has taken enhancements as follows:

The applicant will enhance the program to require functional testing of Halon system smoke detectors in the guardhouse every 5 years; and to require periodic visual inspection of fire barrier walls, ceilings and floors to be performed once every refueling cycle.

Acceptance criteria element under section 5.6 of the program basis document states that the diesel driven fire pump is flow tested to ensure there is no indication of internal fuel supply line corrosion. The GALL AMP states "no corrosion is acceptable in the fuel supply line for the diesel-driven fire pump." The staff will consider issuing an RAI to ask the applicant to explain how the flow test will ensure there is no corrosion.

In the LRA, PINGP takes an exception to performance testing of Halon smoke detectors. The GALL AMP recommends once every six months for performance testing of Halon system

whereas PINGP does the performance testing once every three to five years. The staff will consider issuing an RAI to ask the applicant for a basis for using a different frequency than the GALL recommended frequency.

The staff also audited the operating experience reports including a sample of CRs and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M26 with enhancements, not including any exceptions identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER, and the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.16, Fire Water System Program

In the LRA, the applicant stated that AMP B2.1.16 is an existing program that, following enhancements, will be consistent with GALL AMP XI.M27, "Fire Water System."

During its audit the staff reviewed the applicant's on-site documentation to support its conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|------------------------|--|----------------------|
| 1. LR-AMP-415 | LR AMP Basis Document – Fire Water System | Rev. 2, 8/13/08 |
| 2. FP-PE-SW-01 | SW/MIC Program | Rev. 3, 11/19/07 |
| 3. 5AWI 3.13.0 | Fire Protection Program | Rev. 17, 5/1/07 |
| 4. F5 Appendix K | Fire Protection Systems Operability Requirements | Rev. 11, 10/12/07 |
| 5. SP 1183.1 | Monthly Fire Extinguisher, Hose Station Inspection | Rev. 42 |
| 6. SP 1203 | Annual Hose Station Inspection; Fire Hose hydrostatic test | Rev. 20 |
| 7. SP 1197 | Header/Drains Flush Fire Protection System | Rev. 20 |
| 8. SP 1053 | Fire Protection Pumps monthly test | Rev. 40 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.16 are consistent with GALL AMP XI.M27 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP XI.M27. The staff also verified that the applicant provided an adequate summary description of the program.

In comparing the elements in the applicant's AMP, the staff found that the applicant has taken enhancements as follows:

1. Added a program requirement in the "detection of aging effects," to require testing or replacement of sprinkler heads in service for 50 years.
2. Added a program requirement in the "detection of aging effects" element to include eight additional yard fire hydrants in the scope of the annual inspection and flushing activities.

The staff also audited the operating experience reports including a sample of CRs and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M27.

LRA AMP B2.1.17, Flow-Accelerated Corrosion Program

In the LRA, the applicant stated that AMP B2.1.17 is an existing program that is consistent with GALL AMP XI.M17, "Flow-Accelerated Corrosion."

During its audit the staff reviewed the applicant's on-site documentation to support its conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|-------------------------|--|--------------------------|
| 1. LR-AMP-407 | LR AMP Basis Document – Flow Accelerated Corrosion Program | Rev. 2, 8/21/08 |
| 2. FP-PE-FAC-01 | FAC program | Rev. 4, 5/12/08 |
| 3. Unit 1 Outage Report | PINGP 1R24 Outage Summary Report | April – June 2006 |
| 4. Unit 2 Outage Report | PINGP 2R24 Outage Summary Report | November – December 2006 |
| 5. NSAC-202L-R2 | Recommendation for an effective flow-accelerated program | April 1999 |
| 6. CAP042365 | Elbow and piping below minimum wall | 05/05 |
| 7. CAP01062708 | Drain header below minimum wall | 01/07 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.17 are consistent with GALL AMP XI.M17 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in GALL AMP XI.M17. The staff also verified that the applicant provided an adequate summary description of the program.

The "monitoring and trending" element of GALL AMP XI.M17, states that CHECKWORKS or a similar predictive code is used to predict component degradation in the systems conducive to flow-accelerated corrosion (FAC), as indicated by specific plant data, including material, hydrodynamic, and operating conditions. PINGP stated that CHECKWORKS was implemented in late 2004. The staff will consider issuing an RAI to ask the applicant to provide the methodology used to incorporate the past plant data into CHECKWORKS to create a program baseline, and to provide information on how PINGP monitored FAC prior to CHECKWORKS implementation.

FAC Program document FP-PE-FAC-01, Section 5.8.3 states under component evaluations to compare CHECKWORKS predicted and measured thickness. The staff will consider issuing an RAI to ask the applicant if it has established a relationship between predicted results and actual wall thickness measurements; how often this is done, and what changes to CHECKWORKS are done as a result. If not, how does PINGP ensure that predicted wear rates are accurate?

FAC Program document FP-PE-FAC-01, Section 5.8.4.4 states that system changes could increase wear rates or subsequent reinspection could indicate significantly higher wear rates. The staff will consider issuing an RAI to ask the applicant to provide the process/procedure used to address changes in the chemical, operating and flow conditions that could impact

remaining life predictions, and how these changes are factored into the FAC program so that the remainder of service life can be reevaluated.

The “monitoring and trending” element of GALL AMP XI.M17, states that inspection results are evaluated to determine if additional inspections are needed. The staff will consider issuing an RAI to request the applicant to provide information on how PINGP expands sample size, and what acceptance criterion is used for sample expansion.

The staff will consider issuing an RAI to ask for clarification as to how PINGP calculates minimum permitted wall thickness and how it is used in the FAC analysis. The staff evaluation of the RAIs will be evaluated in the SER.

The staff also audited the operating experience reports including a sample of CRs and interviewed the applicant’s technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The operating experience element of LRA Section B2.1.17, states that PINGP found concerns with compressor and dryer reliability that resulted in increased monitoring and plans for equipment replacement. The staff will consider issuing an RAI to ask for some specific examples of issues that were found in the CRs.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant’s program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M17, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.18, Flux Thimble Tube Inspection Program

In the LRA, the applicant states that AMP B2.1.18 is an existing program that, following enhancements, will be consistent with GALL AMP XI.M37, "Flux Thimble Tube Inspection."

During its audit, the staff reviewed on-site documentation supporting the applicant's conclusion that program elements in the applicant's AMP are consistent with program elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|----------------------|---|-------------------------|
| 1. LR-AMP-423 | License Renewal AMP Basis Document – Flux Thimble Tube Inspection Program | Rev. 2, 8/28/08 |
| 2. D67 | Incore Instrumentation Refueling/ Maintenance Outage Operation | Rev. 29, 6/3/08 |
| 3. Letter | Letter from NSP to NRC, Response to NRC Bulletin 88-09, "Thimble Tube Thinning in Westinghouse Reactors" | 10/31/88 |
| 4. Letter | Letter from NSP to NRC, Supplemental Response to NRC Bulletin 88/09, "Thimble Tube Thinning in Westinghouse Reactors" | 12/13/89 |
| 5. Letter | Letter from NSP to NRC, Supplemental Response to NRC Bulletin 88/09, "Thimble Tube Thinning in Westinghouse Reactors" | 12/26/90 |
| 6. Letter | Letter from NRC to NSP, Response to Bulletin 88-09 Thimble Tube Thinning for the Prairie Island Nuclear Generating Plant Unit Nos. 1 and 2 (TAC Nos. 72674 and 72675) | 10/3/89 |
| 7. AR# 00284748 | Unit 1 Incore Thimble I-11 Showing Significant Wear | 11/24/02 |
| 8. Eddy Current Test | Eddy Current Test Results for Unit 1 and 2 Flux Thimble Tubes (Anatec International) | Various Dates 2002-2006 |
| 9. SE# 335 | 10 CFR 50.59 Safety Evaluation, "Bottom Mounted Instrumentation Flux Thimble Wear" | 4/1/93 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.18 are consistent with GALL AMP XI.M37 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in GALL AMP XI.M37. The staff also verified that the applicant provided an adequate summary description of the program.

The applicant has committed to implement two (2) enhancements affecting the "monitoring and trending" program element. One enhancement requires that the interval between inspections be established such that no flux thimble tube is predicted to have wear that exceeds established acceptance criteria before the next inspection. A second enhancement requires re-baselining of

the examination frequency to be justified using plant-specific wear rate data unless prior plant-specific NRC acceptance for the re-baselining was received and that if a design change to more wear-resistant thimble tube material is made, sufficient inspections will be conducted at an adequate inspection frequency for the new material.

The applicant has also committed to enhance the "corrective actions" program element to require that flux thimble tubes that cannot be inspected be removed from service. The applicant stated that the enhancements are consistent with current implementation practices, and the enhancements formally incorporate these practices into applicable implementing procedures. The staff will consider issuing an RAI to address these issues, and the staff's evaluation will be documented in the SER.

The staff did not identify any additional differences between program elements in the applicant's AMP and program elements recommended in GALL AMP XI.M37.

The staff also audited the applicant's operating experience reports, including a sample of CRs, and interviewed the applicant's technical staff to confirm that plant-specific operating experience does not reveal any degradation not bounded by industry experience.

The staff reviewed the applicant's criteria for allowable flux thimble tube wall thinning before capping or replacement is required. The staff noted that the applicant's original "interim" criteria of 50% allowable wall thinning was increased to 80% allowable wall thinning in 1992, consistent with the recommendations and methodology in Westinghouse report WCAP-12866, "Bottom Mounted Instrumentation Flux Thimble Wear," January 1991. This change is documented in a 10 CFR 50.59 safety evaluation referenced in Section 7.6.2.2.3 of the applicant's updated final safety analysis report. The staff confirmed that the applicant performs eddy current testing of flux thimble tubes at every refueling outage and bases estimates of thimble tube wear, thimble tube wear rates and projected wear on the results of plant-specific wear test data. The staff also noted that the applicant's program has managed the aging effect of wear in the flux thimble tubes for the past 16 years so that no through-wall leakage of flux thimble tubes has been experienced at PINGP.

The 3 program elements: corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared the other 7 program elements in the applicant's program and verified that these 7 elements for the AMP are consistent with those recommended in GALL AMP XI.M37, except for the areas in which the staff felt additional clarification might be warranted as described above. The enhancements identified by the applicant in the LRA for this AMP will be evaluated separately in the SER.

LRA AMP B2.1.19, Fuel Oil Chemistry Program

In the PINGP LRA, the applicant stated that AMP B2.1.19 is an existing program that, following enhancements, will be consistent with GALL AMP XI.M30, "Fuel Oil Chemistry," with exceptions.

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|----------------------------|--|---|
| 1. LR-AMP-416 | Prairie Island Nuclear Generating Plant License Renewal Aging Management Program Basis Document Fuel Oil Chemistry Program | Rev. 2, 7/14/08 |
| 2. Technical Specification | Prairie Island Nuclear Generating Plant Technical Specifications, Section 5.5.11, License Amendment Numbers 184 (Unit 1) and 174 (Unit 2). | Unit 1- Amendment No. 158 Unit 2 - Amendment No. 149 |
| 3. ASTM D 975-77 | Standard Specification for Diesel Fuel Oils | 1977 |
| 4. H30 | Fuel Oil Program | Rev. 5 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.19 are consistent with GALL AMP XI.M30 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP except for the areas that the applicant took exceptions to GALL AMP XI.M30. The staff also verified that the applicant provided an adequate summary description of the program.

In comparing the elements in the applicant's AMP, the staff found that the applicant has committed to implement the following enhancements:

1. Particulate contamination testing of fuel oil in the eleven fuel oil storage tanks will be performed in accordance with ASTM D 6217.
2. One-time ultrasonic thickness measurements will be performed on selected tank bottoms and piping.

The applicant has taken the following two exceptions:

The "monitoring and trending" element of GALL AMP XI.M30, recommends that particulate contamination concentrations are monitored in accordance with plant technical specifications or at least quarterly. The applicant stated in LRA B2.1.19 that particulate contamination testing of fuel oil will be performed annually and not quarterly. The staff will consider issuing an RAI for the applicant to provide justification for use of sampling frequency that is different from the GALL Report recommendation.

Preventive actions such as periodic fuel oil sampling, and draining and cleaning of day tanks are not performed, and additives are not added to fuel oil.

The “monitoring and trending” element of GALL AMP XI.M30 recommends monitoring and trending of biological activity at least quarterly. In its review of LRA B2.1.19 and the associated basis document, the staff noted that the applicant does not state whether or not fuel oil is tested for biological activity. The staff will consider issuing an RAI to address this issue.

GALL AMP XI.M30 recommends ultrasonic thickness measurement for locations where contaminants can accumulate such as tank bottoms in the “detection of aging” element to ensure significant degradation is not occurring. In its review of LRA B2.1.19 and the associated basis document, the staff noted that it is not clear if all fuel tanks that are not subjected to periodic cleaning and visual inspection of the tank interior will be subjected to UT of the tank bottoms, or the extent of UT of tank bottoms (grid size). The staff will consider issuing an RAI to address this issue.

The staff also audited the operating experience reports, including a sample of CRs, and interviewed the applicant’s technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant’s program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M30, except for the areas in which the staff felt additional clarification might be warranted as described above. The exceptions identified by the applicant in the LRA for this AMP will be evaluated separately in the SER.

LRA AMP B2.1.20, Fuse Holder Program

In the LRA, the applicant stated that PINGP AMP B2.1.20 is a new program that will be consistent with the GALL AMP XI.E5, "Fuse Holders."

During its audit, the staff confirmed the applicant's claim of consistency with the GALL AMP. Specifically, the staff interviewed the applicant's technical staff and reviewed the following documents:

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|-------------------------------|---|------------------|
| 1. LR-AMP-439 | Fuse Holder Program | Rev.2, 09/02/08 |
| 2. NUREG-1801 | Generic Aging Lessons Learned (GALL) Report, Section XI.E5 | Rev. 1, 09/05 |
| 3. PINGP LR-AMR-339 | License Renewal Aging Management Review Report, "Electrical Commodities" | Rev. 2, 08/28/08 |
| 4. PINGP Work Order WO 315024 | License Renewal One-Time Fuse JB and TB Box Inspection | 5/30/07 |
| 5. NUREG-1760 | Aging Assessment of Safety-Related Fused Used in Low-and Medium-Voltage Application in Nuclear Power Plants | May 2002 |
| 6. SAND 96-0344 | Aging Management Guideline for Commercial Nuclear Power Plants- Electrical Cables and Terminations | September 1996 |

The Fuse Holders Program is a condition monitoring program that implements periodic visual inspections and tests on fuse holders in the scope of license renewal, located in passive enclosures and assemblies, and exposed to environments (including certain operating conditions) that could potentially lead to electrical circuit failures if left unmanaged. The AMP for fuse holders (metallic clamps) manages the effects of aging caused from the following aging stressors: fatigue, mechanical stress, vibration, chemical contamination, and vibration.

The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP. The staff also verified that the applicant provided an adequate summary description of the program. In comparing the 7 elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.20 are consistent with GALL AMP XI.E5 program elements except in the following area.

The program description of GALL AMP XI.E5 states that the AMP for fuse holders (metallic clamps) needs to account for the following stressors if applicable: fatigue, mechanical stress, vibration, chemical contamination, and corrosion. The applicant's B2.1.20 AMP under the same program element states that the aging management program for fuse holders (metallic clamps) manages the effects of aging from adverse localized environments caused from the following aging stressors, as applicable: fatigue, mechanical stress, vibration, chemical contamination, and corrosion. The environment of the applicant's fuse holders is not consistent with that in the GALL Report which identifies the air-indoor environment (NUREG-1801, Table VI, item VI.A-8). The staff will consider issuing an RAI to address this issue.

The staff reviewed the operating experience reports, including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In LRA Section B2.1.20, the applicant states that PINGP has a comprehensive Operating Experience Program that monitors industry issues/events and assesses these for applicability to its own operations. In addition, the PINGP CAP is used to track, trend and evaluate plant issues and events. Those issues and events, whether external or plant specific, that are potentially significant to the Fuse Holders Program at PINGP are evaluated. The applicant also states that the Fuse Holders Program is augmented if these evaluations show that program changes will enhance program effectiveness. The applicant further states that using the Operating Experience Program and CAP to focus on industry and plant operating experience ensures that Fuse Holders Program issues are addressed in a timely manner and that age related degradation of fuse clamps within the scope of the Fuse Holders Program will be effectively managed throughout the period of extended operation.

The staff reviewed Work Order (WO) 315024. This WO was initiated to inspect and test by thermography all fuse holders in terminal and junction boxes. From this initial inspection and test of a subset population of fuse holders in the scope of license renewal, some enclosures were determined to show significant signs of oxidation that could adversely affect the fuse holders if left undiscovered and not repaired or reworked. The applicant entered these conditions into the CAP for disposition.

The 3 program elements: corrective actions, confirmation process, and administrative controls, were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.E5, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.21, Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program

In the PINGP LRA, the applicant stated that PINGP AMP B2.1.21 is a new program that is consistent with GALL AMP XI.E3, "Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements."

During its audit, the staff reviewed the applicant's on-site documentation to support its conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|----------------------------|--|------------------|
| 1. LR-AMP-432 | Program Basis Document | Rev. 2, 08/14/08 |
| 2. GL 2007-01 | Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients | 2/7/07 |
| 3. CAP0053286 | 22 circ water pump megger failure | 9/27/03 |
| 4. CAP00251176 | 13.8 KV insulator hanger in Cooling Tower Equipment House is shattered | 8/01/02 |
| 5. EPRI TR-109619 | "Guideline for the Management of Adverse Localized Environments" | June 1999 |
| 6. EPRI TR-103834-P1-2 | Effects of Moisture on the Life of Power Plant Cables | August 1994 |
| 7. IEEE Standard 1205-2000 | IEEE guide for Assessing, Monitoring, and Mitigating Effects on Class 1E Equipment Used in Nuclear Power Generating Stations | 3/30/00 |
| 8. NUREG/CR-5643 | Insights Gained From Aging Research, U.S. Nuclear Regulatory Commission | March 1992 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.21 are consistent with GALL AMP XI.E3 program elements. The staff confirmed that the boundary conditions of the plant program envelopes the boundary conditions described in the GALL AMP. In a response to Generic Letter 2007-01, the applicant stated that PINGP intends to implement an Underground Cable Maintenance Program by the end of 2007 due to its history with cables failures. While onsite, the staff found that the applicant had not yet implemented this program. Therefore, the staff will consider issuing an RAI to address this issue, and the staff's evaluation will be documented in the SER.

The staff also reviewed the operating experience reports including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In reviewing operating experience for PINGP, the staff noted two separate cable failure and one additional failed cable test. The staff noted PINGP has operating experience with medium voltage cable failures and a failed megger test. Corrective actions have been taken to address all cable failure issues.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.E3, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.22, Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program

In the LRA, the applicant stated that AMP B2.1.22 is a new program that when implemented will be consistent with GALL AMP XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components."

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|-----------------|---|-------------------|
| 1. LR-AMP-438 | License Renewal AMP Basis Document – Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program | Rev. 2, 8/28/08 |
| 2. CAP01063226 | Wall Thickness Reduction | 11/21/06 |
| 3. CAP00763691 | Piping and Support Degradation | 10/12/04 |
| 4. CAP00195868 | Through Wall Valve Body Leak | 6/6/02 |
| 5. FP-WM-OVW-01 | Work Management Process Overview | Rev. 1, 11/20/07 |
| 6. SWI M-20 | Section Work Instruction – Conduct of Maintenance | Rev. 17, 10/25/06 |
| 7. SWI M-24 | Section Work Instruction – Maintenance Training Plan | Rev. 15, 10/2/07 |
| 8. FP-PA-ARP-01 | Corrective Actions Program (CAP) Action Request Process | Rev. 20, 7/30/08 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.22 are consistent with GALL AMP XI.M38 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP. The staff also verified that the applicant provided an adequate summary description of the program.

During the audit of the applicant's program basis documents, the staff noted that the applicant expanded the scope of materials and aging effects for this program beyond the recommendations of GALL XI.M38. The staff also noted that the applicant did not state that the expansion in the scope of aging effects and materials was an exception to the recommendations to GALL XI.M38. The staff will consider issuing an RAI to address this discrepancy, and the staff's evaluation will be documented in the SER.

The staff also audited the operating experience reports, including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. During its review, the staff noted that a 24 inch Unit 1 cooling water piping (24-CL-16) downstream of a motor actuated valve (MV-32037), had experienced wall thinning below the ANSI B31.1 minimum wall thickness. The applicant had noted this area was not leaking and had initiated corrective actions to address this issue. The applicant used nondestructive examination (NDE) methods

to size the flaw and then performed an evaluation to ensure the piping would continue to meet its design requirements. It was concluded by the applicant that the piping was degraded but remained operable. Per ASME Code Case N-513-2, the applicant was required to take further actions and have them tracked. As required, the applicant performed a re-inspection and noted that the flaw size was unchanged from the original report, the applicant performed an augmented ultrasonic test (UT) inspection of an expanded sample size of components which did not indicate a minimum wall thickness of the examined components and the applicant repaired the degraded piping during the refueling outage in December 2006. The staff also noted that the applicant discovered a pin-hole leak in the turbine oil cooler (CW-27-2) valve body. Subsequent UT results and evaluation by the applicant determined that the cause of the pin-hole was the result of microbiologically influenced corrosion. The applicant later replaced the valve during the Unit 1 refueling outage in November 2002.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M38, except for the areas that the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.23, Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems Program

In the PINGP LRA, the applicant stated that PINGP AMP B2.1.23 is an existing program that is consistent with GALL AMP XI.M23, "Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems," with enhancements. The enhancements include guidance in licensee procedures to inspect for corrosion and wear where omitted, and ensure all components and structures subject to inspection are clearly identified, which affect the scope of program, and parameters monitored or inspected GALL program elements.

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the AMP elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|------------------------------------|---|------------------|
| 1. LR-AMP-412 | Inspection of Overhead Heavy Load & Light Load (Related to Refueling) Handling Systems Program | Rev. 2, 9/2/08 |
| 2. CMAA-70 | Specifications for Electric Overhead Traveling Cranes | 1975 |
| 3. EOCI-61 | Specifications for Electric Overhead Traveling Cranes | 1961 |
| 4. PINGP Docket No. 50-282, 50-306 | Letter to NRC: "Control of Heavy Loads (Response to Staff Concerns on the Six Month Submittal)" | 11/8/82 |
| 5. D58 | Heavy Loads Program | Rev. 32, 4/17/07 |
| 6. PM 3160-1 | Containment Polar Crane Mechanical Inspection | Rev. 10, 6/2/08 |
| 7. D58.0.9 | Polar Crane Inspections Before Major Heavy Load Lifts | Rev. 2, 2/25/00 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.23 are consistent with GALL AMP XI.M23 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP XI.M23. The staff also verified that the applicant provided an adequate summary description of the program.

The staff found that the GALL Report acceptance criteria program element included reference to the use of EOCI-61 as guidance for the containment polar cranes and turbine cranes. According to the GALL Report recommendations, use of the specification that was applicable at the time the crane was manufactured is acceptable. The staff reviewed both the EOCI-61 specifications, and the CMAA-70 specifications as recommended in the GALL Report, as well as the licensee's point by point comparison of the two specifications. The point by point comparison was previously submitted to and accepted by the NRC in 1982.

The staff also reviewed the operating experience reports, including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. A CR indicated that in

2003 a crack was discovered in the turbine building crane girder. A NDE was completed to verify the crack and the staff found that proper corrective actions were taken to address the issue.

The 3 program elements: corrective actions, confirmation process and administrative controls were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M23.

LRA AMP B2.1.24, Lubricating Oil Analysis Program

In the PINGP LRA, the applicant stated that AMP B2.1.24 is an existing program that is consistent with GALL AMP XI.M39, "Lubricating Oil Analysis Program."

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT | TITLE | REVISION/DATE |
|---------------|---|-----------------|
| 1. LR-AMP-424 | Prairie Island Nuclear Generating Plant License Renewal Aging Management Program Basis Document, Lubricating Oil Analysis Program | Rev. 2, 7/18/08 |
| 2. H32.2 | Lubrication Sampling and Analysis Program | Rev. 4 |
| 3. MSIP 1001 | Oil Sampling | Rev. 14 |
| 4. AT-0175 | Action Request Record Report, Conduct FSA of the Oil Analysis Program in 4 Q 06. | 3/30/07 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.24 are consistent with GALL AMP XI.M39 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP XI.M39. The staff also verified that the applicant provided an adequate summary description of the program.

The staff noted that lubricating oil is sampled and evaluated in accordance with industry and manufacturer standards at frequencies such that water and particulate contamination can be detected, thus precluding loss of material and loss of heat transfer.

The staff also audited the operating experience reports, including a sample of reports available in the CAP, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements: corrective actions, confirmation process, and administrative controls, were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M39.

LRA AMP B2.1.25, Masonry Wall Program

In the PINGP LRA, the applicant stated that PINGP AMP B2.1.25 is an existing program that is consistent with GALL AMP XI.S5, "Masonry Wall Program."

During its audit the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|-----------------|--|-------------------|
| 1. LR-AMP-428M | License Renewal Aging Management Program Basis Document Masonry Wall Program | Rev. 2, 08/28/08 |
| 2. H24 | Maintenance Rule Program | Rev. 11, 10/08/07 |
| 3. H24.3 | Structures Monitoring Program | Rev. 4, 9/10/07 |
| 4. PM 3586-10 | Periodic Structures Inspection | Rev. 4, 7/18/07 |
| 5. EM 2.1.2 | PINGP Site Engineering Manual, Block Wall | Rev. 1, 1/26/00 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.25 are consistent with GALL AMP XI.S5 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP XI.S5. The staff also verified that the applicant provided an adequate summary description of the program.

The staff noted that the Masonry Wall Program includes the guidance and lessons learned from Office of Inspection and Enforcement Bulletin 80-11 and Information Notice 87-67. During the audit and review, the staff asked for the visual examination frequency for the program and its technical basis. In its response, the applicant stated that the visual inspections are at least every five years to ensure no loss of intended function between inspections.

The staff also reviewed the operating experience reports, including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements: corrective actions, confirmation process and administrative controls were reviewed as part of the Scoping and Screening methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL Report XI.S5.

LRA AMP B2.1.26, Metal Enclosed Bus Program

In the LRA, the applicant stated that PINGP AMP B2.1.26 is a new program that will be consistent with GALL AMP XI.E4, "Metal Enclosed Bus."

During its audit, the staff confirmed the applicant's claim of consistency with the GALL AMP. Specifically, the staff interviewed the applicant's technical staff and reviewed the following documents:

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|-----------------------|--|------------------|
| 1. LR-AMP-433 | Metal Enclosed Bus Program | Rev. 2, 08/28/08 |
| 2. NUREG-1801 | Generic Aging Lessons Learned (GALL) Report, Section XI.E4 | Rev. 1, 09/05 |
| 3. PINGP LR-AMR-339 | License Renewal Aging Management Review Report, "Electrical Commodities" | Rev. 2 |
| 4. PINGP PE 0005 | Indoor Bus Duct Preventive Maintenance | Rev. 2 |
| 5. PINGP CRs-20017096 | Investigate 1MX&1MY Bus Duct Degradation | |
| 6. SAND 96-0344 | Aging Management Guideline for Commercial Nuclear Power Plants- Electrical Cables and Terminations | September 1996 |

The Metal Enclosed Bus (MEB) Program is a condition monitoring program that inspects MEBs that are in-scope of license renewal. Internal visual inspection is performed to observe signs of aging of the bus insulation materials (such as cracking and discoloration), evidence of loose connections, and signs of moisture and debris intrusion.

The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in GALL AMP XI.E4. The staff also verified that the applicant provided an adequate summary description of the program. In comparing the elements in the applicant's program to GALL AMP XI.E4, the staff verified that the program elements contained in PINGP AMP B2.1.26 are consistent with GALL AMP XI.E4 program elements except the following areas.

The scope of program in GALL AMP XI.E4 is to inspect all MEBs within the scope of license renewal and a sample of accessible bolted connections. In the plant basis document, under program description, parameters monitored/inspected, and detection of aging effects, the applicant states that it will inspect representative samples of MEBs within the scope of license renewal. The applicant stated that this element is consistent with GALL AMP XI.E4 element 1 (scope of program). The staff will consider issuing an RAI to address this issue.

The applicant stated that AMP B2.1.26 will be used to visually inspect the interior as well as the exterior of MEBs. GALL AMP XI.E4 recommends inspecting the interior of MEBs and the Structure Monitoring Program will inspect the exterior of MEBs. This is an exception to the

GALL. The applicant claimed that this element is consistent with the GALL AMP XI.E4 program element. The staff will consider issuing an RAI to address this issue.

Under program element 3 (parameters monitored/inspected), GALL AMP XI.E4 states that the internal bus supports will be inspected for structural integrity and signs of cracks. The applicant did not address this component in element 3. The staff will consider issuing an RAI to address this issue.

Under program element 6 (acceptance criteria), GALL AMP XI.E4 describes the acceptance criterion for each inspection for a particular subcomponent (e.g., bolted connections need to be below the maximum allowed temperature when thermography is used or a low resistance value appropriate for the application when resistance measurement is used). In AMP B2.1.26, under the same element, the applicant stated that the acceptance for each inspection and test is defined by the specific type of test performed. This does not adequately address acceptance criteria. The staff will consider issuing an RAI to address this issue.

The staff reviewed the operating experience reports, including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. The applicant stated that the MEB Program is new, and therefore, has no operating experience related to program implementation and a review of the plant operating experience reveals that previous inspections of bus ducts have identified degraded components that were repaired/replaced to preclude electrical failures. The applicant also stated that past inspections discovered corroded interior parts of MEB sections in 1MX/1MY Bus Duct as a result of moisture intrusion, and expanded the scope of inspection to internal electrical components in other MEB ducts having the same configuration and environments (outdoors). The staff reviewed CR Number 20017096 investigating the root cause for the 1MX/1MY degradation and verified that the applicant appropriately identified the roots causes and took appropriate corrective actions to address bus duct degradation issues.

The 3 program elements, corrective actions, confirmation process and administrative controls were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.E4, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.27, Nickel-Alloy Nozzles and Penetrations Program

In the PINGP LRA, the applicant commits to comply with applicable NRC orders, and implement applicable NRC Bulletins, Generic Letters, and staff-accepted industry guidelines in AMP B2.1.27 consistent with GALL AMP XI.M11, "Nickel-Alloy Nozzles and Penetrations Program," to manage cracking due to primary water stress corrosion cracking (PWSCC).

During its audit, the staff reviewed the applicant's on-site documentation to determine whether the program elements in the applicant's AMP are consistent with the elements in the GALL Report program. The staff auditor interviewed the applicant's technical staff and reviewed the following additional on-site documents and listed below:

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|-----------------|---|---------------|
| 1. L-PI-03-084 | Nuclear Regulatory Commission Bulletin 2003-02: Leakage from Reactor Pressure Vessel Lower Head Penetrations and Reactor Coolant Pressure Boundary Integrity – 30-Day Response | 9/19/03 |
| 2. L-PI-03-101 | 60-Day Report Pursuant to NRC Bulletin 2003-02 for 2003 Prairie Island Unit 2 Lower Head Penetration Inspection | 12/9/03 |
| 3. L-PI-05-002 | 60-Day Report Pursuant to NRC Bulletin 2003-02 for 2004 Prairie Island Unit 1 Lower Head Penetration Inspection | 1/24/05 |
| 4. L-PI-04-088 | 60-Day Response to Bulletin 2004-01, "Inspection of Alloy 82/182/600 Materials Used in the Fabrication of Pressurizer Penetrations and Steam Space Piping Connections at Pressurized-Water Reactors | 7/27/04 |
| 5. L-PI-04-084 | Supplement to Bulletin 2002-01, "Reactor Pressure Head Degradation and Reactor Coolant Pressure Boundary Integrity," 60-Day Response for the Prairie Island Nuclear Generating Plant, Request for Additional Information (TAC Nos. MB4568 and MB4569) | 7/30/04 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.27 are consistent with GALL AMP XI.M11 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP. The staff also verified that the applicant provided an adequate summary description of the program.

The staff noted that the applicant complies with all NRC Orders, Generic Letters, and Bulletins, related to PWSCC of nickel-alloys.

In LRA Section B2.1.27, the applicant committed to comply with applicable NRC Orders, and implement applicable NRC Bulletins, Generic Letters, and staff-accepted industry guidelines with regard to nickel-alloy components. However, no operating experience with regard to

nickel-alloy components was provided in LRA Section B2.1.27. The staff will consider issuing an RAI to request plant specific operating experience with regard to nickel-alloy components other than those of the closure head. The staff's evaluation will be documented in the SER.

The 3 program elements, corrective actions, confirmation process and administrative controls were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.11, except for the areas in which the staff felt additional clarification might be warranted, as described above.

LRA AMP B2.1.28, Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Heads of Pressurized Water Reactors Program

In the PINGP LRA, the applicant states that AMP B2.1.28 is an existing program with enhancements that is consistent with the program elements in GALL AMP XI.M11A, "Nickel-Alloy Penetration Nozzles Welded to the Upper Reactor Vessel Closure Head."

During its audit, the staff reviewed the applicant's on-site documentation to determine whether the program elements in the applicant's AMP are consistent with the elements in the GALL Report program. The staff interviewed the applicant's technical staff and reviewed the following additional on-site documents and NRC-issued documents listed below.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|--|--|-----------------|
| 1. LR-AMP-406 | Prairie Island Nuclear Generating Plant License Renewal Aging Management Program Basis Document, Nickel-Alloy Penetration Nozzles Welded To The Upper Reactor Vessel Closure Heads Of Pressurized Water Reactors Program | Rev. 2, 7/22/08 |
| 2. PINGP Surveillance Procedure SP 1410 [2410] | RV Head Effective Degradation Year | Rev. 1 |
| 3. Order EA 03-009 | Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors | 2/11/03 |
| 4. First Revised Order EA 03-009 | Issuance of Revised Order EA-09-003 Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors | 2/20/03 |
| 5. PINGP Administrative Work Instruction 5AWI 3.12.2 | ASME Section XI Repair Replacement Program | Rev. 14 |
| 6. PINGP Calculation ENG-ME-535 | Effective Degradation Years for Unit 1& 2 Calculated to Refuel Outages 1R24 and 2R24 | Rev. 4 |
| 7. Letter | NRC Bulletin 2002-02: Reactor Pressure Vessel Head and Vessel Head Penetration Nozzle Inspection Programs – 15–Day Response | 8/26/02 |
| 8. Letter | 15–Day Response to NRC Bulletin 2002-01, Reactor Pressure Vessel Head Degradation and Reactor Coolant Pressure Boundary Integrity | 4/3/02 |
| 9. Letter | Response to NRC Bulletin 2001-01, "Circumferential Cracking of Reactor Pressure Vessel Head Penetration Nozzles" | 9/4/01 |

| | | |
|-------------------------------|---|---------|
| 10. L-PI-03-100, 10 CFR 2.202 | 60-Day Report Pursuant to NRC Order EA-03-009 Paragraph E for 2003 Prairie Island Unit 2 Reactor Pressure Vessel Head Inspection | 12/2/03 |
| 11. L-PI-03-071 | Supplemental Response to NRC Bulletins 2001-01 and 2002-01 | 8/5/03 |
| 12. L-PI-03-021, 10 CFR 2.202 | Response to Order EA-03-009, "Issuance of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors" | 3/3/03 |
| 13. L-PI-04-035, 10 CFR 2.202 | Response to Revised Order EA-03-009, "Issuance of First Revised NRC Order (EA-03-009) Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors" | 3/8/04 |
| 14. L-PI-05-003, 10 CFR 2.202 | 60-Day Report Pursuant to EA-03-009 Paragraph E for 2004 Prairie Island Unit 1 Reactor Pressure Vessel Head Inspection | 1/24/05 |
| 15. L-PI-06-062, 10 CFR 2.202 | 60-Day Report Pursuant to EA-03-009 Paragraph E for 2006 Prairie Island Unit 1 Reactor Pressure Vessel Head Inspection | 8/7/06 |
| 16. L-PI-07-012, 10 CFR 2.202 | 60-Day Report Pursuant to EA-03-009 Paragraph E for 2006 Prairie Island Unit 2 Reactor Pressure Vessel Head Inspection | 2/13/07 |
| 17. L-PI-08-037, 10 CFR 2.202 | 60-Day Report Pursuant to EA-03-009 Paragraph E for 2006 Prairie Island Unit 1 Reactor Pressure Vessel Head Inspection | 8/7/06 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.28 are consistent with GALL AMP XI.M11A program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP except for the areas that the applicant took exceptions to GALL AMP XI.M11A. The staff also verified that the applicant provided an adequate summary description of the program.

The staff noted in the Program Basis Document, LR-AMP-406 and supporting references that:

1. the applicant has adhered to all NRC Orders and responded appropriately to all generic communications.
2. both closure heads that have nozzles and penetrations fabricated from Alloy 600 have been replaced with Alloy 690 heads. Alloy 690 is resistant to PWSCC.
3. inspection requirements and scope have been established in accordance with the First Revised NRC Order EA-03-009.

In reviewing the elements in the applicant's AMP, the staff found that the applicant has enhanced the AMP as follows:

- Detection of Aging Effects

The program will require that any deviations from implementing the appropriate required inspection methods of the NRC First Revised Order EA-03-009, "Issue of Order Establishing Interim Inspection Requirements for Reactor Pressure Vessel Heads at Pressurized Water Reactors," dated February 20, 2004 (Order), as amended, will be submitted for NRC review and approval in accordance with the Order, as amended.

- Monitoring and Trending

The program will require that 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.

- Acceptance Criteria

Relevant flaw indications detected during the augmented inspections of the upper vessel head penetration nozzles will be evaluated in accordance with the criteria provided in the 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.

- Corrective Actions

The program will require that, if leakage or evidence of cracking in the vessel head penetration nozzles (including associated J-groove welds) is detected while ranked in the "Low," "Moderate," or "Replaced" susceptibility category, the nozzles are to be immediately reclassified to the "High" susceptibility category and the required augmented inspections for the "High" susceptibility category are to be implemented during the same outage the leakage or cracking is detected.

The staff also audited the operating experience reports, including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M11A.

LRA AMP B2.1.29, One-Time Inspection Program

In the LRA, the applicant states that AMP B2.1.29 is a new program that will be consistent with GALL AMP XI.M32, "One-Time Inspection."

During its audit, the staff reviewed on-site documentation supporting the applicant's conclusion that program elements in the applicant's AMP are consistent with program elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|------------------|---|-----------------|
| 1. LR-AMP-418 | License Renewal AMP Basis Document – One-Time Inspection Program | Rev. 2, 9/2/08 |
| 2. 5AWI 14.3.0 | Nondestructive Examination | Rev. 4, 4/23/04 |
| 3. FP-PE-NDE-03 | Written Practice for Qualification and Certification of NDE Personnel | Rev. 5, 7/2/08 |
| 4. SWI NDE-NDE-1 | Equipment, Personnel and Material Reporting | Rev. 1, 4/27/05 |
| 5. CAP031213 | Pinhole Leak Found on Discharge of "23 Charging Pump" | 7/14/06 |
| 6. CAP034884 | "21 Aux Feedwater" Suction Line Has MIC Influencing Bacteria Present | 3/29/07 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.29 are consistent with GALL AMP XI.M32 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP XI.M32. The staff also verified that the applicant provided an adequate summary description of the program.

During review of the applicant's on-site documents, the staff did not identify any differences between program elements in the applicant's AMP and program elements recommended in the GALL Report for AMP XI.M32.

In the license renewal AMP basis document the applicant states that the One-Time Inspection Program relies upon the established NDE techniques of the ASME Code Section XI Inservice Inspection Program or alternate examination techniques not specified by ASME Code Section XI, if appropriate. The applicant states that sampling approaches at other sites holding renewed licenses will also be considered. The applicant refers to the methodology discussed in EPRI TR-107514, "Age-Related Degradation Inspection Methods and Demonstration: In Behalf of Calvert Cliffs Nuclear Power Plant License Renewal Application," as one industry source to be considered in developing the One-Time Inspection Program.

The applicant states that the One-Time Inspection Program is a new program, and there has been no operating experience related to program implementation. However, the staff reviewed selected operating experience reports related to the existing programs for which the One-Time Inspection Program confirms effectiveness (e.g., Water Chemistry Program, Fuel Oil Chemistry Program, Lubricating Oil Analysis Program). The staff also interviewed the applicant's technical

staff to confirm that plant-specific operating experience does not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared the other 7 program elements in the applicant's program and verified that these 7 elements for the AMP are consistent with those recommended in GALL AMP XI.M32.

LRA AMP B2.1.30, One-Time Inspection of ASME Code Case Class 1 Small Bore Piping

In the LRA, the applicant stated that PINGP AMP B2.1.30 is a new program that is consistent with GALL AMP XI.M35, "One-Time Inspection of ASME Code Class 1 Small Bore Piping."

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL report. The staff interviewed the applicant's technical staff and reviewed the following on-site documents listed.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|---------------------------|---|---------------|
| 1. LR-AMP-421 | One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program | Rev. 2 |
| 2. 5AWI 14.6.0 | ASME Section XI Inservice Inspection and Pressure Testing | Rev: 9 |
| 3. Unit 1 Report | PI Unit 1 Small-Bore UT Examinations Performed in 2006 Refueling Outage | 5/22/06 |
| 4. H10.5 | 4 th Interval Inservice Inspection Plan – Unit 1& 2 December 21,2004 Through December 20, 2014 | Rev. 3 |
| 5. NRC Bulletin No. 88-08 | Response to NRC Bulletin No. 88-08, "Thermal Stresses In Piping Connected to Reactor Coolant Systems" | 9/30/88 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.30 are consistent with GALL AMP XI.M35 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in GALL AMP XI.M35. The staff also verified that the applicant provided an adequate summary description of the program.

The staff audited the applicant's operating experience and selected reports associated with the ISI of small-bore piping. The staff also interviewed the applicant's technical staff to confirm that plant-specific operating experience did not reveal any degradation outside the bounds of industry experience.

The application stated that the One-Time Inspection of ASME Class 1 Small-Bore Piping Program is new and therefore there is no operating experience for the effectiveness of the program. In order to be consistent with the staff's recommendations in Section A.1.2.3.10, Item 2 of SRP-LR Branch Position RLSB-1 (i.e. Branch Position RLSB-1 of Appendix A to NUREG-1800), an applicant may have to commit to providing operating experience in the future for new programs to confirm their effectiveness. The staff may request that, consistent with the statement in the SRP-LR, that the applicant make a commitment to provide future operating experience to the staff for those new AMPs to confirm effectiveness for the period of extended operation. The staff's evaluation will be documented in the SER.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M35, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.31, Open-Cycle Cooling Water System Program

In the LRA, the applicant states that AMP B2.1.31 is an existing program that is consistent with GALL AMP XI.M20, "Open-Cycle Cooling Water System."

During the audit, the staff reviewed on-site documentation supporting the applicant's conclusion that program elements in the applicant's AMP are consistent with program elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|------------------|--|------------------|
| 1. LR-AMP-410 | License Renewal AMP Basis Document – Open-Cycle Cooling Water System Program | Rev.2, 9/2/08 |
| 2. H21 | Generic Letter 89-13 Implementing Program | Rev.13, 5/2/08 |
| 3. FP-PE-SW-01 | SW/MIC Program | Rev. 3, 11/29/07 |
| 4. CD 5.25 | Generic Letter 89-13 Standard | Rev. 1, 4/19/07 |
| 5. CD 5.17 | Flow Accelerated Corrosion and Service Water Inspection Program Standard | Rev. 3, 7/1/08 |
| 6. RPIP 3050 | Corrosion Monitoring and Control Program | Rev. 11, 6/10/08 |
| 7. SWI NDE-UT-9 | Ultrasonic Detection of Pitting | Rev. 1, 3/16/06 |
| 8. AR# 01060472 | Low Wall Thickness found on 3-ZH-62 | 11/8/06 |
| 9. AR# 00597454 | Tubes Found Plugged in "12 DD CLG" Pump Gear Oil Cooler | 4/19/04 |
| 10. AR# 00584224 | During Cleaning of "D2 Air Cooler Hx" Maintenance Found 7 Tubes Plugged | 3/8/04 |
| 11. AR# 00282738 | Potential Silting/Sediment Concerns with Plant Equipment and Systems | 11/16/02 |
| 12. AR# 00755961 | Documentation of Tube Plugging for "11 CCHX" | 9/23/04 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.31 are consistent with GALL AMP XI.M20 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP except for the areas that the applicant took exceptions to GALL AMP XI.M20. The staff also verified that the applicant provided an adequate summary description of the program.

The GALL AMP relies on the applicant's implementation of recommendations in Generic Letter (GL) 89-13, "Service Water System Problems Affecting Safety-Related Equipment," and the staff noted that the applicant's specific commitments in response to GL-89-13 are listed in the applicant's GL-89-13 Implementing Program document. During review of the applicant's on-site documents, the staff did not identify any differences between program elements in the applicant's AMP and program elements recommended in the GALL Report for AMP XI.M20.

The staff also audited the applicant's operating experience reports, including a sample of CRs, and interviewed the applicant's technical staff to confirm that plant-specific operating experience

does not reveal any degradation not bounded by industry experience. Examples of the applicant's operating experience reviewed by the staff demonstrate capability of the existing program to detect loss of material resulting in decreased wall thickness in piping components, to detect fouling in piping and heat exchangers serviced by the open-cycle cooling water system, and to implement appropriate corrective actions when such conditions are detected.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared the other 7 program elements in the applicant's program and verified that these 7 elements for the AMP are consistent with those recommended in GALL AMP XI.M20.

LRA AMP B2.1.33, Reactor Head Closure Studs

In the PINGP LRA, the applicant stated that PINGP AMP B2.1.33 is an existing program that is consistent with GALL AMP XI.M3, "Reactor Head Closure Studs" with an enhancement. The enhancement is related to the CAP element in which PINGP commits to the guidance requirements of Regulatory Guide (RG) 1.65.

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|-----------------|--|------------------|
| 1. LR-AMP-434 | Reactor Head Closure Studs Program | Rev. 2, 9/2/08 |
| 2. 5AWI 14.6.0 | ASME Section XI Inservice Inspection and Pressure Testing | Rev. 9, 6/22/07 |
| 3. 1D7 | Unit 1 Reactor Vessel Closure | Rev. 0, 12/24/07 |
| 4. H10.5 | 4 th Interval Inservice Inspection Plan Units 1&2 December 21, 2004 Through December 20, 2014 | Rev. 3, 6/9/08 |
| 5. 2.24A #M491 | Equipment Specifications- Reactor Vessel | Rev. 2, 10/21/69 |
| 6. 2D7 | Unit 2 Reactor Vessel Closure | Rev. 3, 5/15/08 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.33 are consistent with GALL AMP XI.M3 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP XI.M3. The staff also verified that the applicant provided an adequate summary description of the program.

The staff verified consistency with the GALL Report "preventive actions" program element recommending the use of acceptable surface treatments and stable lubricants. The staff reviewed the material specification sheet for the lubricant used and verified that the lubricant did not include any unstable compounds identified in RG 1.65.

The staff also reviewed the operating experience reports, including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. Two undesirable indications have been recorded on the reactor head closure studs at the PINGP site. These conditions were minor in severity, and were corrected through their CAP. PINGP did not identify any adverse trend in program performance. PINGP also reviews industry operating experience and completes periodic self assessments to evaluate their own program effectiveness.

The 3 program elements, corrective actions, confirmation process and administrative controls were reviewed as part of the Scoping and Screening Methodology audit. During AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M3.

LRA AMP B2.1.35, RG 1.127, Inspection of Water-Control Structures Inspection Associated with Nuclear Power Plants Program

In the PINGP LRA, the applicant stated that PINGP AMP B2.1.35 is an existing program that is consistent with GALL AMP XI.S7, "RG 1.127, Inspection of Water-Control Structures Inspection Associated with Nuclear Power Plants Program."

During its audit the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|------------------|---|-------------------|
| 1. LR-AMP-428W | RG 1.127, Inspection Of Water-Control Structures Associated With Nuclear Power Plants | Rev. 2, 8/28/08 |
| 2. LR-TR-519 | Tech. Review for Aging Management Program Elements 7, 8, & 9 | Rev. 0 |
| 3. H24.3 | Structures Monitoring Program | Rev. 4, 9/10/07 |
| 4. PM 3512-8 | Five Year Underwater Inspection of Screenhouse Inlet(s) | Rev. 1, 9/30/04 |
| 5. PM 3586-10 | Periodic Structures Inspection | Rev. 4, 7/18/07 |
| 6. PM 3108-2 | Cooling Water Emergency Intake Structures 5-years inspection | Rev. 3, 4/25/05 |
| 7. Procedure H24 | Maintenance Rule Program | Rev. 11, 10/08/07 |
| 8. LER 01-01-03 | Plant in Unanalyzed Condition due to Flood Panel Deficiencies for April 2002 | April 2002 |
| 9. CAP 01058242 | Approach Canal: Evaluation of 2002 Soundings from intake Crib to Main Channel | 11/25/02 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.35 are consistent, with enhancements, with GALL AMP XI.S7 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP XI.S7. The staff also verified that the applicant provided an adequate summary description of the program.

The staff noticed that RG 1.127 focuses on dams, reservoirs behind those dams, and dam safety and outlet works that deliver cooling water from reservoirs and spill excess water to prevent dam overtopping. These components are not within the scope of license renewal at PINGP. However, the program considers the guidance in RG 1.127 and American Concrete Institute (ACI) 349.3R-96 if it is necessary to evaluate degradation mechanisms and questionable concrete conditions.

The staff also reviewed the operating experience provided in the license renewal basic documents as included in the above table, including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience.

The 3 program elements, corrective actions, confirmation process and administrative controls were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.S7.

LRA AMP B2.1.36, Selective Leaching of Materials Program

In the PINGP LRA, the applicant stated that B2.1.36 is a new program that is consistent with GALL AMP XI.M34, "Selective Leaching of Materials," with an exception.

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL Report. The staff interviewed the applicant's technical staff and reviewed the following on-site document listed.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|-----------------|---|------------------|
| 1. LR-AMP-419 | Selective Leaching of Materials Program | Rev. 2, 07/14/08 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.36 are consistent with GALL AMP XI.M34 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP except for the areas that the applicant took exceptions to GALL AMP XI.M34. The staff also verified that the applicant provided an adequate summary description of the program.

In the application, the applicant proposed an exception to GALL AMP XI.M34 program elements: Scope of Program, Parameters Monitored/Inspected, and Detection of Aging Effects that would allow alternative detection techniques, which may be used instead of, or in addition to, visual inspection and hardness testing. The staff will review the exception and may consider issuing an RAI that requests the applicant provide additional information concerning alternative detection techniques and justification for using these techniques.

The staff audited operating experience and interviewed the applicant's technical staff to confirm that plant-specific operating experience did not reveal any degradation outside the bounds of industry experience.

In the application, the applicant stated that there is no operating experience for the effectiveness of the program because it is a new program. In order to be consistent with the staff's recommendations in Section A.1.2.3.10, Item 2 of SRP-LR Branch Position RLSB-1 (i.e. Branch Position RLSB-1 of Appendix A to NUREG-1800), an applicant may have to commit to provide operating experience in the future for new programs to confirm their effectiveness. The staff may request that, consistent with the statement in the SRP-LR, the applicant make a commitment to provide future operating experience to the staff for those new AMPs to confirm effectiveness for the period of extended operation.

The 3 program elements, corrective actions, confirmation process, and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M34, not including the exception identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER, and the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.37, Steam Generator Tube Integrity Program

In the LRA, the applicant stated that AMP B2.1.37 is an existing program that is consistent with GALL AMP XI.M19, "Steam Generator Tube Integrity," with an exception.

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|---------------------------|--|------------------------|
| 1. LR-AMP-409 | Steam Generator Tube Integrity Program | Rev. 2, September 2008 |
| 2. NEI 97-06 | Steam Generator Program Guidelines | Rev. 2, May 2005 |
| 3. NEI 97-06 | Steam Generator Program Guidelines | Rev. 1, January 2001 |
| 4. A/R No. 00888189 | Action Request Report | 4/30/06 |
| 5. L-HU-06-026 | Supplement to Application For Technical Specification Improvement Regarding Steam Generator Tube Integrity | 7/21/06 |
| 6. | Response to Generic Letter 97-06 Steam Generator Internals Degradation | 3/30/98 |
| 7. Letter from NEI to NRC | NEI 97-06 Steam Generator Program Guidelines, Revision 2 | 9/9/05 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.37 are consistent with GALL AMP XI.M19 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP except for the areas that the applicant took exceptions to GALL AMP XI.M19. The staff also verified that the applicant provided an adequate summary description of the program.

In the application, the applicant proposed an exception to GALL AMP XI.M19 program elements, Scope of Program, that would allow the use of NEI 97-06, "Steam Generator Program Guidelines," Revision 2 instead of Revision 1, which is recommended in GALL AMP XI.M19. The staff will review the exception and may consider issuing an RAI that requests the applicant provide additional information concerning the use of an alternative document.

The staff reviewed the applicant's operating experience associated with the Steam Generator Tube Integrity Program. The staff audited operating experience and selected reports and letters. The staff interviewed the applicant's technical staff to confirm that plant-specific operating experience did not reveal any degradation outside the bounds of industry experience.

The 3 program elements, corrective actions, confirmation process, and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M19, not including

the exception identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER.

LRA AMP B2.1.38, Structures Monitoring Program

In the PINGP LRA, the applicant stated that PINGP AMP B2.1.38 is an existing program that is consistent with GALL AMP XI.S6 "Structures Monitoring Program."

During its audit the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|---------------------------------------|--|----------------------|
| 1. LR-TR-533 | Industry and Plant Specific Operating Experience for Structural Components | Rev. 0, 3/19/08 |
| 2. LR-AMP-428 | License Renewal Aging Management Program Basis Document Structure Monitoring Program | Rev. 2, 8/15/08 |
| 3. Procedure H24 | Maintenance Rule Program | Rev.11, 10/8/07 |
| 4.Procedure H24.3 | Structures Monitoring Program | Rev. 4, 9/10/07 |
| 5.PM 3586-10 | Periodic Structures Inspection | Rev. 4, 7/18/07 |
| 6. LER 1-01-03, Sup. 1 (CR 200201003) | Plant in Unanalyzed Condition Due to Flood Panel Deficiencies Leak Paths in D5/D6 Bldg Flood Wall | Initiated 2/1/02 |
| 7. CAP 01058242 | Uncertainty in profile of approach Canal | Initiated 10/27/06 |
| 8. CAP 01143002 | Designed Flow Path to CL Emergency Intake Line is 78% blocked | Initiated 7/2/08 |
| 9. CAP 030691 | Refueling Cavity Leakage into Sump B and C | 6/5/03 |
| 10. CAP 01064513 | Leakage of borated water from both the Unit 1 and Unit 2 refueling cavities and through the concrete backing the liners since 1998 | 11/29/06 |
| 11. SMP 3Q07 Inspection Report | Structures Monitoring Program Report | Initiated 8/8/07 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.38 are consistent, with enhancement, with GALL AMP XI.S6 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP XI.S6. The staff also verified that the applicant provided an adequate summary description of the program.

It is not clear as to how the PINGP program satisfies the GALL Report program element "Detection of Aging Effects." PINGP's enhancement for this program element does not include the frequency of sampling of groundwater for pH, chloride, and sulfate concentrations. During its audit and review, the staff asked the applicant to provide the results for the last two samplings of groundwater. The applicant provided the 2005 and 2006 results. But, it was the result from a single well. Therefore, the staff will consider issuing an RAI to address this issue.

The staff conducted a field walk-down with the applicant technical staff to the fuel oil transfer house, screenhouse, turbine building, intake canal, approach canal, diesel generator building,

administration building addition, station blackout structures, and the yard. Overall, the staff noticed that the masonry wall's structures and structure components of the above areas appeared to be in good operating condition.

The staff also reviewed the operating experience provided in the license renewal basis documents as included in the above table, including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. It is not clear to the staff as how it satisfies the GALL Report program element under operating experience. (PINGP has leakage of borated water (CAP 01064513) from the Unit 1 and Unit 2 refueling cavities and through the concrete backing the liners since 1998. However, the leak has not been pinpointed and corrective action has not been completed.) The staff will consider issuing an RAI to address this issue.

The 3 program elements, corrective actions, confirmation process and administrative controls were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.S6, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.39, Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS) Program

In the PINGP LRA, the applicant stated that PINGP AMP B2.1.39 is a new program that is consistent with GALL AMP XI.M12, "Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS)."

During its audit, the staff reviewed the applicant's on-site documentation supporting the applicant's conclusion that the program elements are consistent with the elements in the GALL Report. The staff interviewed the applicant's technical staff and reviewed the following on-site documents listed below:

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|----------------------------|--|----------------|
| 1. LR-AMP-435 | Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS) Program | Rev. 2, 9/2/08 |
| 2. WCAP-11655 | (Excerpt) Component Topical Report for the Life Extension Evaluation of Prairie Reactor Coolant Piping | |
| 3. WCAP-11655 Supplement 1 | (Excerpt) Component Topical Report for Prairie Island Phase II Life Extension Study: Part 2 – Leak-Before-Break for Unit 2 Primary Loop Components | |
| 4. LTR-RIDA-06-60 | Prairie Island Unit 2 Leading Edge Flow Meter (LEFM) Aging Management Review | 11/3/06 |
| 5. TR-106092 WO2643-33 | Evaluation of Thermal Aging Embrittlement for Cast Austenitic Stainless Steel Components in LWR Reactor Coolant Systems | September 1997 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.39 are consistent with GALL AMP XI.M12 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP except for the areas that the applicant took exceptions to GALL AMP XI.M12. The staff also verified that the applicant provided an adequate summary description of the program.

The staff reviewed the applicant's operating experience associated with thermal aging embrittlement of CASS components. The staff audited operating experience and selected reports and interviewed the applicant's technical staff to confirm that plant-specific operating experience did not reveal any degradation outside the bounds of industry experience.

The application states that the Thermal Aging Embrittlement of Cast Austenitic Stainless Steel (CASS) Program is a new program and therefore there is no operating experience for the effectiveness of the program. In order to be consistent with the staff's recommendations in Section A.1.2.3.10, Item 2 of SRP-LR Branch Position RLSB-1 (i.e. Branch Position RLSB-1 of Appendix A to NUREG-1800), an applicant may have to commit to providing operating

experience in the future for new programs to confirm their effectiveness. The staff may request that, consistent with the statement in the SRP-LR, that the applicant make a commitment to provide future operating experience to the staff for those new AMPs to confirm effectiveness for the period of extended operation.

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP XI.M12, except for the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B2.1.40, Water Chemistry Program

In the LRA, the applicant states that AMP B2.1.40 is an existing program that, following an enhancement, will be consistent with GALL AMP XI.M2, "Water Chemistry," with exceptions.

During its audit, the staff reviewed on-site documentation supporting the applicant's conclusion that program elements in the applicant's AMP are consistent with program elements in the GALL AMP. The staff interviewed the applicant's technical staff and reviewed the following on-site documents.

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|----------------------------------|--|------------------|
| 1. LR-AMP-404 | License Renewal AMP Basis Document – Water Chemistry Program | Rev. 2, 8/28/08 |
| 2. Technical Requirements Manual | Technical Requirements Manual, Section 3.4, Reactor Coolant System (RCS) | Rev. 5 |
| 3. SWCPP | Strategic Water Chemistry Plan for PINGP Primary System Chemistry | Rev. 6, 9/27/05 |
| 4. SWCPS | Strategic Water Chemistry Plan for PINGP Secondary System Chemistry | Rev. 8, 4/26/08 |
| 5. RPIP 3006 | Primary Water Chemistry Guidelines | Rev. 12, 5/24/06 |
| 6. RPIP 3002 | Secondary Water Chemistry Guidelines | Rev. 17 |
| 7. RPIP 3101 | Chemistry Sampling Frequencies and Limits | Rev. 31, 11/1/05 |
| 8. RPIP 3025 | Chemistry Performance Indicator Reporting Instructions | Rev. 2, 4/28/05 |
| 9. AR# 0851246 | Visual Evidence of Cracking in Accumulator Cladding | 5/29/05 |
| 10. AR# 01007440 | Upward Trend on Various BAST (Boric Acid Storage Tank) Levels | 12/14/05 |
| 11. AR# 00853604 | Oxygen Levels in RCS Slowed Going to Mode 4 | 6/6/05 |
| 12. AR# 00848115 | Chloride Excursion in U2 Primary | 5/21/05 |
| 13. AR# 00816855 | U1 Primary Hydrogen out of Specification | 3/08/05 |
| 14. AR# 00813065 | Unit 2 Condensate Oxygen Reached EPRI Action Level 1 | 2/8/05 |
| 15. Metals Analysis Report | Metals Analysis Report – Prairie Island Unit 1 and Unit 2 | 6/21/08 |
| 16. Metals Analysis Report | Metals Analysis Report – Prairie Island Unit 1 and Unit 2 | 7/7/08 |

In comparing the 7 program elements in the applicant's program, the staff verified that the program elements contained in PINGP AMP B2.1.40 are consistent with GALL AMP XI.M2 program elements. The staff confirmed that the boundary conditions of the plant program are enveloped by the boundary conditions described in the GALL AMP except for the areas that the applicant took exceptions to GALL AMP XI.M2. The staff also verified that the applicant provided an adequate summary description of the program.

The staff noted that the applicant has committed to implement an enhancement affecting the “monitoring and trending” program element. The enhancement requires increased sampling to be performed as needed to confirm effectiveness of corrective actions taken to address an abnormal chemistry condition.

The applicant took an exception to the “parameters monitored/inspected” program element: feedwater samples are not monitored for total copper because the plant is an all-ferrous plant with no copper sources.

The applicant also took two exceptions to the “acceptance criteria” program element: 1) primary water (reactor coolant) dissolved oxygen action level limits are consistent with the Technical Requirements Manual, but above the corresponding recommended EPRI guideline limits, and 2) feedwater hydrazine levels during heatup, hot shutdown, and startup (Modes 2, 3, and 4) are maintained greater than 100 ppb, which is higher and more conservative than the 20 ppb required by the EPRI guidelines.

The staff will consider issuing an RAI(s) to address the enhancement and exceptions identified by the applicant, and the staff’s evaluation will be documented in the SER.

In addition to the enhancement and exceptions identified by the applicant, the staff noted differences between program elements in the applicant’s AMP and program elements recommended in the GALL Report for AMP XI.M2. Information in the license renewal AMP basis document indicates that there are differences between the water chemistry diagnostic parameters actually monitored and those recommended to be monitored in the EPRI guidelines referenced in the GALL Report. However, the differences between diagnostic parameters monitored and those recommended to be monitored are not identified as exceptions to the GALL Report’s recommendations.

The staff will consider issuing an RAI asking the applicant to provide additional information explaining why the difference noted above is not identified as an exception to recommendations in the GALL Report and to justify that with this difference the applicant’s AMP provides acceptable aging management for components within its scope during the period of extended operation.

The staff audited the applicant’s operating experience reports, including a sample of CRs, and interviewed the applicant’s technical staff to confirm that plant-specific operating experience does not reveal any degradation not bounded by industry experience. The staff also reviewed recent metal analysis reports which confirm that copper and zinc concentrations in the applicant’s primary system are less than the minimum detectable concentration for these metals (<0.005 ppb).

The 3 program elements, corrective actions, confirmation process and administrative controls were audited as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared the other 7 program elements in the applicant’s program and verified that these 7 elements for the AMP are consistent with those recommended in GALL AMP XI.M2, not including any exceptions identified by the applicant in the LRA for this AMP, which will be evaluated separately in the SER, and the areas in which the staff felt additional clarification might be warranted as described above.

LRA AMP B3.1, Environmental Qualification (EQ) of Electric Components Program

In the PINGP LRA, the applicant stated that AMP B3.1 is an existing program that is consistent with GALL AMP X.E1, "Environmental Qualification of Electric Components."

During its audit, the staff confirmed the applicant's claim of consistency with the GALL AMP. Specifically, the staff interviewed the applicant's technical staff and reviewed the following documents:

| DOCUMENT NUMBER | TITLE | REVISION/DATE |
|--|--|-------------------|
| 1. LR-AMP-402 | Environmental Qualification of Electrical Components Program | Rev. 2, 8/18/08 |
| 2. NMC Procedure CD 5.11 | Equipment Environmental Qualification Standard | Rev. 1, 5/12/04 |
| 3. PINGP Procedure H8.0 | EQ User's Manual | Rev. 15, 12/14/04 |
| 4. PINGP Procedure H8-A | User's Manual Appendix A EQ Master List | Rev. 15, 1/25/07 |
| 5. PINGP Administrative Work Instruction 5AWI 3.22.0 | Environmental Qualification | Rev. 4, 3/31/04 |

The EQ program implements the requirements of 10 CFR 50.49. The EQ program manages component thermal, radiation, and cyclical aging through the use of aging evaluations based on 10 CFR 50.49(f) qualification methods to assure that certain electrical components located in harsh plant environments are qualified to perform their safety function in those harsh environments. As required by 10 CFR 50.49, EQ components not qualified for the license term are to be refurbished or replaced, or have their qualification extended, prior to reaching the aging limits established in the evaluation.

In comparing the elements in the applicant's program presented in LR-AMP-402, "Environmental Qualification of Electrical Components Program," to GALL AMP X.E1, the staff verified that the program elements are consistent with GALL AMP X.E1 program elements except in the following areas.

The GALL Report AMP X.E1 under program description discusses in detail reanalysis attributes. Important attributes for the reanalysis of an aging evaluation include analytical methods, data collection and reduction methods, underlying assumptions, acceptance criteria and corrective actions. In LRA Section B3.1 under description, the applicant did not describe in detail the reanalysis attributes in the program description of PINGP AMP B3.1. The staff will consider issuing an RAI to address this issue.

Under the program element 1 (scope of program), the GALL Report AMP X.E1 states that this program applies to certain electrical components that are important to safety and are exposed to

harsh environment accident conditions. Electrical equipment important to safety includes safety-related, non-safety-related whose failure could prevent satisfactory accomplishment of safety functions, and certain post-accident monitoring equipment specified in RG 1.97. In PINGP AMP B3.1 under the same element, the applicant states that this AMP consists of PINGP activities that manage aging effects for electrical commodity groups of the electrical cables and connections subject to 10 CFR 50.49 EQ requirements. The applicant claimed that this element is consistent with element 1 of the GALL Report AMP X.E1. The staff will consider issuing an RAI to address this issue since the scope of applicant's program is only limited to passive commodity group of cables and connections while the scope of GALL Report AMP X.E1 includes all active and passive electrical equipment important to safety.

In the LRA Appendix A, FSAR Supplement, Section A3.0, the applicant did not provide an adequate summary of the time-limited aging analysis (TLAA) evaluation of the EQ of electric equipment as contained in SRP-LR Section 4.4, Table 4.4-2. The staff will consider issuing an RAI to address this issue.

The staff reviewed the operating experience reports, including a sample of CRs, and interviewed the applicant's technical staff to confirm that the plant-specific operating experience did not reveal any degradation not bounded by industry experience. In the plant design basis document (LR-AMP-402), the applicant stated that PINGP operating experience shows some past issues. The EQ Program and Design Engineering used informal and non-controlled temperature monitoring data, which affects the integrity of the EQ qualification files. The applicant stated that it upgraded EQ files, and revised the EQ procedures to improve the program process to maintain basis references. The applicant also stated that the analysis in UFSAR Appendix G (Figure 3.G.1) shows Shield Building Annulus response to low break loss of coolant accident (LBLOCA), that used results in peak containment shell temperature of 222 degree F, with a corresponding peak Shield Building temperature of 161 degree F. More recent analyses resulted in higher peak containment shell temperature, 245 degree F for LBLOCA and 266 degree F for main steam line break (MSLB), making the analysis in UFSAR Appendix G non-conservative and inadequate for EQ purposes. The applicant further stated that its EQ department assessed all components, and their respective EQ files, and determined that all components were capable of performing their design functions, and the non-conformance was limited to EQ file documentation. The applicant upgraded the EQ files to include the new temperature data. These issues were identified by the PINGP CAP for resolution and compliance with all regulatory and EQ Program requirements.

The 3 program elements, corrective actions, confirmation process and administrative controls were reviewed as part of the Scoping and Screening Methodology audit. During the AMP audit, the staff compared 7 program elements in the applicant's program and verified that these 7 elements for the AMP were consistent with those specified in GALL AMP X.E1, except for the areas in which the staff felt additional clarification might be warranted as described above.