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U S Nuclear Regulatory Commission
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Prairie Island Nuclear Generating Plant Units 1 and 2
Dockets 50-282 and 50-306
License Nos. DPR-42 and DPR-60

Supplemental Information Regarding Application for Renewed Operating Licenses

By letter dated April 11, 2008, Northern States Power Company, a Minnesota Corporation, (NSPM) submitted an Application for Renewed Operating Licenses (LRA) for the Prairie Island Nuclear Generating Plant (PINGP) Units 1 and 2. This letter amends the LRA to provide supplemental information addressing certain issues that have been raised as contentions in this License Renewal proceeding.

Enclosure 1 contains an updated LRA Section B1.1 which better defines the meaning of the term "Consistent with NUREG-1801" as it relates to the descriptions of Aging Management Programs.

Enclosure 2 contains new LRA Sections A2.41 and B2.1.41, and revisions to Sections 2.1.1.4.3, B1.5 and B2.0, which incorporate a Protective Coating Monitoring and Maintenance Program.

Enclosure 3 contains updated LRA Sections B2.0 and B2.1.17 to reflect adoption of the latest EPRI guidance in the Flow-Accelerated Corrosion Program and provide additional detail in the LRA. Conforming changes to LRA Section 3 are also provided.

If there are any questions or if additional information is needed, please contact Mr. Eugene Eckholt, License Renewal Project Manager.

Summary of Commitments

This letter contains no new commitments or changes to existing commitments.

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I declare under penalty of perjury that the foregoing is true and correct.
Executed on March 12, 2009.

Michael D. Wadley

Michael D. Wadley
Site Vice President, Prairie Island Nuclear Generating Plant Units 1 and 2
Northern States Power Company - Minnesota

Enclosures (3)

cc:

Administrator, Region III, USNRC
License Renewal Project Manager, Prairie Island, USNRC
Resident Inspector, Prairie Island, USNRC
Prairie Island Indian Community ATTN: Phil Mahowald
Minnesota Department of Commerce

Enclosure 1
Revision to LRA Section B1.1 Regarding Consistency with NUREG-1801

LRA Section B1.1 is hereby revised to define NUREG-1801 Consistency as it relates to the descriptions of Aging Management Programs in Appendix B of the LRA.

LRA Section B1.1 on Page B-1 is revised in its entirety to read as follows:

B1.1 Overview

License Renewal Aging Management Program (AMP) descriptions are provided in this appendix for each program credited for managing aging effects based upon the aging management review results provided in Sections 3.1 through 3.6 of this application. One additional program, the Protective Coating Monitoring and Maintenance Program, has been included because of its importance to debris control following a postulated LOCA, even though the coatings themselves are not relied upon to protect coated carbon steel components.

Two of the programs consist of commitments that conform to the program descriptions provided in NUREG-1801, Sections XI.M11 and XI.M16, and the discussions in the corresponding aging management review line items of NUREG-1801 Chapter IV.

The remaining programs are described in terms of their consistency with NUREG-1801 (GALL Report). The ten generic program elements defined in Appendix A.1, Section A.1.2.3 of NUREG-1800 have been addressed for each AMP. Each of the new or existing AMPs described in this appendix has been evaluated for consistency with the ten program-specific element discussions in the applicable program description in NUREG-1801, Chapter X or XI. This appendix summarizes the evaluation results for each program and indicates whether the program elements are consistent with, consistent with enhancements, or consistent with exceptions, to the corresponding program described in NUREG-1801.

Where the discussion states that a plant program is (or will be) consistent with the recommendations of NUREG-1801, takes no exceptions to NUREG-1801, and identifies no enhancements, such statements constitute certification that (1) the plant program corresponds to and contains all of the elements of the referenced GALL Report program; (2) the conditions at the plant are bounded by the conditions for which the GALL Report program was evaluated to the extent such conditions are specified in the GALL program description; and (3) verifications have been completed and are documented on site in an auditable form. Therefore, based on this certification, the Aging Management Program identified in the GALL Report is being used.

Where the discussion of an Aging Management Program states that the plant program will be consistent with the recommendations of NUREG-1801, takes no exceptions to NUREG-1801, but identifies enhancements, such statements constitute certification that (1) with those enhancements, the plant program corresponds to and contains all of the elements of the referenced GALL Report program; (2) the conditions at the plant are bounded by the conditions for which the

GALL Report program was evaluated to the extent such conditions are specified in the GALL program description; and (3) verifications have been completed and are documented on site in an auditable form. Therefore, based on this certification, the Aging Management Program identified in the GALL Report is being used.

Where the discussion of an Aging Management Program states that the plant program is (or will be) consistent with the recommendations of NUREG-1801 with exception(s), with or without enhancements, such statements constitute certification that (1) with the exclusion of the specific matters identified in each exception, the plant program corresponds to and contains all of the elements of the referenced GALL Report program; (2) the conditions at the plant are bounded by the conditions for which the GALL Report program was evaluated to the extent such conditions are specified in the GALL program description; and (3) verifications have been completed and are documented on site in an auditable form. Therefore, based on this certification, the Aging Management Program identified in the GALL Report is being used, as modified by the exceptions. A justification for each identified exception is provided.

Enclosure 2
Revisions to LRA Sections 2.1.1.4.3, A2.41, B1.5, B2.0 and B2.1.41
to Incorporate a Protective Coating Monitoring and Maintenance Program

The LRA is hereby revised to incorporate a Protective Coating Monitoring and Maintenance Program. The specific LRA changes are as follows:

In LRA Section 2.1.1.4.3 on Page 2.1-8, the last paragraph is revised to read as follows:

> The contribution of coatings to containment debris is event driven and is not a result of aging. The applicable coatings are not relied upon to protect coated carbon steel components from corrosion. In addition, the issue is not related to the 40-year term of the current operating license; and therefore, is not a TLAA. However, because the management of containment coatings is important for controlling the amount of debris available to be deposited on containment sump strainers following a LOCA, PINGP has chosen to include a Protective Coating Monitoring and Maintenance Program in LRA Section B2.1.41. PINGP does not credit the Protective Coating Monitoring and Maintenance Program for the prevention of corrosion of carbon steel components. The purpose of the Protective Coating Monitoring and Maintenance Program is to ensure that the amount of coatings that could fail during a LOCA and become debris load on the containment sump B strainers does not exceed the strainers' design limits.

New LRA Section A2.41 is added on Page A-17 to read as follows:

> **A2.41 Protective Coating Monitoring and Maintenance Program**
>
> The Protective Coating Monitoring and Maintenance Program monitors the performance of Service Level I coated surfaces inside containment through periodic coating examinations, condition assessments, and remedial actions including repair or removal. The program provides direction for the procurement of Service Level I coatings and prescribes methods to apply and maintain Service Level I coatings. Records are maintained to ensure that the amount of unqualified or degraded qualified coatings do not exceed the prescribed limits.
>
> PINGP does not credit the Protective Coating Monitoring and Maintenance Program for the prevention of corrosion of carbon steel components. The purpose of the Protective Coating Monitoring and Maintenance Program is to ensure that the amount of coatings that could fail during a LOCA and become debris load on the containment sump B strainers does not exceed the strainers' design limits. The program is implemented as described in the PINGP response to NRC Generic Letter 98-04.

In LRA Section B1.5 on Page B-6, a new item 41 is added to appear as follows:

> 41. Protective Coating Monitoring and Maintenance Program [Section B2.1.41]

Enclosure 2
Revisions to LRA Sections 2.1.1.4.3, A2.41, B1.5, B2.0 and B2.1.41
to Incorporate a Protective Coating Monitoring and Maintenance Program

In LRA Section B2.0 on Page B-11, line item XI.S8 of the NUREG-1801 program correlation table is revised to appear as follows:

NUREG-1801 ID	NUREG-1801 Program	PINGP Program	NUREG-1801 Comparison
XI.S8	Protective Coating Monitoring and Maintenance Program	Protective Coating Monitoring and Maintenance Program [Section B2.1.41]	Existing Program, Consistent with NUREG-1801

New LRA Section B2.1.41 is added on Page B-82 to read as follows:

B2.1.41 Protective Coating Monitoring and Maintenance Program

Program Description

The Protective Coating Monitoring and Maintenance Program monitors the performance of Service Level I coated surfaces inside containment through periodic coating examinations, condition assessments, and remedial actions including repair or removal. The program provides direction for the procurement of Service Level I coatings and prescribes methods to apply and maintain Service Level I coatings. Service Level I coatings are subject to the requirements of ANSI N101.2-1972, ANSI N101.4-1972, and programmatic controls.

Service Level I protective coatings (identified in Regulatory Guide 1.54 as coatings inside containment) are procured, applied, inspected, and maintained in a manner that is consistent with the licensing basis and regulatory requirements applicable to PINGP as indicated in the plant's response to NRC Generic Letter 98-04. These activities ensure operability of post-accident safety systems which rely on water recycled through the containment sump system. The Protective Coating Monitoring and Maintenance Program implements these activities.

PINGP does not rely upon protective coatings to protect coated carbon steel components from corrosion, and does not credit the Protective Coating Monitoring and Maintenance Program for the prevention of corrosion. The purpose of the Protective Coating Monitoring and Maintenance Program is to ensure that the amount of coatings that could fail during a LOCA and become debris load on the containment sump B strainers does not exceed the strainers' design limits.

NUREG-1801 Consistency

The Prairie Island Nuclear Generating Plant Protective Coating Monitoring and Maintenance Program is an existing program. It is consistent with the recommendations of NUREG-1801, Chapter XI, Program XI.S8, Protective Coating Monitoring and Maintenance Program.

Enclosure 2
Revisions to LRA Sections 2.1.1.4.3, A2.41, B1.5, B2.0 and B2.1.41
to Incorporate a Protective Coating Monitoring and Maintenance Program

Exceptions to NUREG-1801

None

Enhancements

None

Aging Management Program Elements

The elements of the Protective Coating Monitoring and Maintenance Program are described below. The results of an evaluation of each element with respect to the NUREG-1801, Chapter XI Program XI.S8, Protective Coating Monitoring and Maintenance Program, are also provided.

Scope of Program

The Protective Coating Monitoring and Maintenance Program manages the condition of Service Level I coatings inside the Units 1 and 2 reactor containment vessels whose failure could adversely affect the operation of post-accident fluid systems and thereby impair safe shutdown. The scope is consistent with the definition of Service Level I coatings identified in Regulatory Guide 1.54, Revision 1. The condition of coated surfaces inside containment is managed to ensure that post-accident accumulation of failed coating debris on the containment sump B strainers does not exceed the strainers' design limits.

The Protective Coating Monitoring and Maintenance Program monitors the performance of Service Level I coated surfaces inside containment through periodic coating examinations, condition assessments, and remedial actions including repair or removal. The program provides direction on the procurement of Service Level I coatings and prescribes methods to apply and maintain Service Level I coatings. Records are maintained to ensure that the amount of unqualified or degraded qualified coatings do not exceed the prescribed limits. The program was established in accordance with the guidance provided in ASTM D 5163-04a.

This element is consistent with NUREG-1801, Program XI.S8 Element 1, Scope of Program.

Preventive Actions

Although the application of coatings provides a preventive action of corrosion protection, PINGP does not rely upon Service Level I protective coatings inside containment to manage aging of the coated base metal. The program manages the degradation of coatings to ensure that the amount of coatings that could fail

during a LOCA and become debris load on the containment sump B strainers does not exceed the strainers' design limits.

This element is consistent with NUREG-1801, Program XI.S8 Element 2, Preventive Actions.

Parameters Monitored/Inspected

In accordance with ASTM D 5163-04a, subparagraph 9.2, the Protective Coating Monitoring and Maintenance Program parameters monitored or inspected include any visible defects, such as blistering, cracking, flaking, peeling, delaminating, rusting, discoloration, and damage, among other indications.

A line by line comparison of ASTM D 5163-05a, subparagraph 10.2, and ASTM D 5163-04a, subparagraph 9.2, indicates that both standards are identical for this discussion. Therefore the use of ASTM D 5163-04a is not considered an exception to NUREG-1801. (Note: NUREG-1801, Program XI.S8 Element 3, Parameters Monitored/Inspected, incorrectly references subparagraph 10.2 in ASTM D 5163-05. This subparagraph does not exist in this revision to the standard. The correct citation would be to ASTM D 5163-05a, subparagraph 10.2.)

This element is consistent with NUREG-1801, Program XI.S8 Element 3, Parameters Monitored/Inspected.

Detection of Aging Effects

A visual inspection is performed inside containment for evidence of degraded qualified coatings during each refueling outage in accordance with the guidance in ASTM D 5163-04a, paragraph 5. Unqualified coatings are all assumed to fail as a result of a LOCA, and their inspection is conducted every other refueling outage to verify the design basis for debris loading of the sump strainers is met.

The qualifications of the individuals who coordinate and perform coating condition assessments or evaluate the inspection results meet or exceed the requirements of ASTM D 5163-04a, paragraph 8.

The development of an inspection plan and the methods of performing the inspection, identified in ASTM D 5163-04a, subparagraph 9.1, are incorporated into the Protective Coating Monitoring and Maintenance Program. The inspection plan provides for visual inspections along with more detailed inspections for certain areas based on their potential to transport debris to the RHR recirculation strainers, potentially plugging the strainers or being ingested into the ECCS. Plant procedures provide requirements for pre-job briefs and post-job critiques. Drawings are used to map out areas inside containment that could be exposed to latent effects from spray or flooding (i.e., Zone of Influence)

and areas within a specific distance from postulated breaks where spray would cause destruction of the coatings (i.e., Zone of Destruction). Inspection Data Sheets and photographs are used to record the findings/observations. The program also utilizes ASTM Standards and test methods for evaluating degraded conditions. Instruments and equipment used during the inspection process include flashlight, thickness gages, tape measure, knife, marking pen, binoculars, and camera. A containment coatings assessment report is written to document activities performed to verify that coatings continue to meet the design and licensing basis.

A line by line comparison of ASTM D 5163-05a, subparagraphs 6, 9, 10.1 and 10.5, and ASTM D 5163-04a, subparagraphs 5, 8, 9.1 and 9.5, indicates that both standards are identical for these discussions. Therefore the use of ASTM D 5163-04a is not considered an exception to NUREG-1801. (Note: NUREG-1801, Program XI.S8 Element 4, Detection of Aging Effects, incorrectly references subparagraphs in ASTM D 5163-05 that either do not exist or do not contain the desired content. The correct citation would be to ASTM D 5163-05a, subparagraphs 6, 9, 10.1, and 10.5.)

This element is consistent with NUREG-1801, Program XI.S8 Element 4, Detection of Aging Effects.

Monitoring and Trending

To assist in predicting the degradation process of coatings, the last two previous Containment Coatings Assessment Reports are reviewed prior to each containment coating inspection in order to identify trends. Trending helps to ensure corrective or mitigative actions are taken in a timely manner. This trending process meets the criteria in subparagraph 6.2 of ASTM D 5163-04a.

Inspection results are reviewed and corrective action is taken, including repair, removal, or evaluation for any identified degradation. Degradation that is not repaired or removed is evaluated in accordance with the plant's corrective action process, and degraded coating that is left in place in an area which could add to the volume of failed coatings is added to the Unqualified and Degraded (Qualified) Coatings Log and evaluated. The log compares the current inspection results against the established acceptance criteria and previous assessment results to ensure that the total volume of postulated failed coatings is less than the design limits. This evaluation ensures that the recirculation strainers will not clog from coating debris following a LOCA, and will function as designed satisfying the criteria of subparagraph 10.1.2 of ASTM D 5163-04a.

A line by line comparison of ASTM D 5163-05a, subparagraphs 7.2 and 11.1.2, and ASTM D 5163-04a, subparagraphs 6.2 and 10.1.2, indicates that both standards are essentially identical (except for minor editorial differences) for these discussions. Therefore the use of ASTM D 5163-04a is not considered an

exception to NUREG-1801. (Note: NUREG-1801, Program XI.S8 Element 5, Monitoring and Trending, incorrectly references subparagraphs 7.2 and 11.1.2 in ASTM D 5163-05 that either do not exist or do not contain the desired content. The correct citation would be to ASTM D 5163-05a, subparagraphs 7.2 and 11.1.2.)

This element is consistent with NUREG-1801, Program XI.S8 Element 5, Monitoring and Trending.

Acceptance Criteria

The Protective Coating Monitoring and Maintenance Program characterizes, documents, and tests defective or deficient coatings in accordance with subparagraphs 9.2.1 through 9.2.6, 9.3, and 9.4 of ASTM D 5163-04a. These items are summarized as follows.

- Characterization: Defective or deficient coated surfaces are characterized as exhibiting blisters, cracking, flaking/peeling/delamination, rusting, and discoloration. If these conditions are identified they are documented per the following instructions.

  - Blisters
    Measure the area of the blistering and the thickness of the coating in that area. Using ASTM D714 categorize the degree of blistering. Record the information on the Inspection Data Sheet.

  - Cracking
    Measure the length of the crack or if extensive cracking has occurred, measure the size of the area affected. Determine if the cracking is isolated or is part of a pattern. Record measurements and describe crack depth and pattern on the Inspection Data Sheet. Photograph the area affected.

  - Flaking/Peeling/Delaminating
    Measure the approximate size of the peels and note the pattern formed. Carefully test to see if lifting can easily be achieved beyond the obvious peeled area. Note observations on the Inspection Data Sheet and photograph the affected area.

  - Rusting
    Compare with the pictorial standards of ASTM D610/SSPC VIS 2 to determine the degree of rusting. Try to determine the source of rusting (i.e., is it staining from rusting elsewhere or is it a failure of the coating allowing the substrate to rust). Measure the area and thickness of coating in the affected area. Note observations on the Inspection Data Sheet and photograph the area.

- Discoloration
  Identify areas of discoloration. Measure the area and note observations on the Inspection Data Sheet.

Coating defects are documented in a written report and/or in photographs, and include any applicable measurements of the degraded condition.

- Testing: Additional testing such as ASTM D 4541, Test Method for Pull-off Strength of Coatings Using Portable Adhesion Testers, and ASTM D 6677, Standard Test Method for Evaluation by Knife, are employed for areas where the qualification is in question.

The assessment report includes a summary of the inspected areas and inspections performed. The assessment report also summarizes the amount of unqualified and degraded qualified coatings being left in containment and remedial actions taken; identifies new findings; compares current results against established acceptance criteria and previous assessment results; and includes evaluations of coatings not remediated and failure analysis of degraded coatings. The program requires corrective action (i.e., repair or removal of coating) or an evaluation if the degraded qualified coating is left in place and could add to the volume of failed coatings. The coatings evaluation personnel are knowledgeable and experienced in nuclear coatings work. Coatings evaluation personnel evaluate the Inspection Data Sheets, initiate corrective actions, review trends, and summarize findings of observed conditions and actions taken to correct the conditions.

A line by line comparison of ASTM D 5163-05a, subparagraphs 10.2.1 through 10.2.6, 10.3, 10.4, and 12, and ASTM D 5163-04a, subparagraphs 9.2.1 through 9.2.6, 9.3, 9.4, and 11, indicates that both standards are essentially identical (except for minor editorial differences) for these discussions. Therefore the use of ASTM D 5163-04a is not considered an exception to NUREG-1801. (Note: NUREG-1801, Program XI.S8 Element 6, Acceptance Criteria, incorrectly references subparagraphs in ASTM D 5163-05 that either do not exist or do not contain the desired content. The correct citation would be to ASTM D 5163-05a, subparagraphs 10.2.1 through 10.2.6, 10.3, 10.4, and 12.)

This element is consistent with NUREG-1801, Program XI.S8 Element 6, Acceptance Criteria.

Corrective Actions, Confirmation Process, Administrative Controls

These elements are consistent with the corresponding NUREG-1801, Program XI.S8 aging management program elements. See Section B1.3 for further discussion.

Operating Experience

The Protective Coating Monitoring and Maintenance Program is an existing program that incorporates both industry and plant specific operating experience to provide added assurance that the condition of coatings inside containment will be managed effectively during the period of extended operation.

A review of operating experience indicates that the Protective Coating Monitoring and Maintenance Program has been effective in monitoring coatings inside containment by identifying degraded conditions, performing evaluations and corrective actions ensuring that the amount of coatings that could fail during a LOCA and become debris load on the containment sump B strainers does not exceed the strainers' design limits.

Examples of degraded coatings identified during the Unit 1 coatings inspections in May 2006 include:

- Flaking and chipping near the drain at the 695' elevation in zone B over an area of 4 sq ft, and a thickness of 0.028 inches, and
- Flaking and chipping inside the Regenerative Heat Exchanger Room at elevation 695' over an area of 5 sq ft, and a thickness of 0.028 inches.

Examples of degraded coatings identified during the Unit 2 coatings inspections in November 2006 include:

- Flaking on grating below RCS piping in the 21 RCP/SG vault lower level over an area of 6 sq ft, and a thickness of 0.007 inches, and
- Delamination/chipping on the ladder to lower 21 RCP/SG vault of an insignificant area, and a thickness of 0.007 inches.

Examples of degraded coatings identified during the Unit 1 coatings inspections in February 2008 include:

- Cracking on the Sump B platform at elevation 695' of zone A over an area of 0.5 sq ft, and a thickness of 0.028 inches, and
- Flaking on a hanger support at elevation 695' of zone B over an area of 1 sq ft, and a thickness of 0.007 inches.

For the above three examples of degraded coatings inspection findings, corrective action was taken to remove the identified degraded coatings, or for those areas where the degraded coatings were not removed, an evaluation was performed to review the amount of unqualified coatings to ensure that the volume of debris left in containment was less than the calculated limit.

The basis for the program is industry operating experience as documented in NRC Regulatory Guide 1.54 and several NRC Generic Communications

including Information Notice 97-13, Generic Letter 98-04, Bulletin 2003-01 and Generic Letter 2004-02. The industry experience cited in these publications deals principally with debris that could block emergency recirculation during a design basis accident. A few examples of minor coating deterioration are cited. Accumulated experience with coatings in other applications shows that high temperature and fluid jet forces can result in detachment from the substrate and disintegration. Therefore, the Regulatory Guide and the program both address the possibility that all unqualified coatings, qualified coatings in the Zones of Destruction and degraded qualified coatings in the Zones of Influence will be transported to the recirculation sump inlet strainers. Program activities and acceptance criteria are based on the postulate that this will occur.

This element is consistent with NUREG-1801, Program XI.S8 Element 10, Operating Experience.

Conclusion

The PINGP Protective Coating Monitoring and Maintenance Program is an existing program that has successfully monitored the performance of coatings inside the containments. Proper maintenance of protective coatings has ensured that the quantities of unqualified and degraded qualified coatings inside the containments are maintained below the acceptance limits, and that post-accident safety systems that rely on water recycled through the containment sump system remain operable.

Implementation of the Protective Coating Monitoring and Maintenance Program provides reasonable assurance that the performance of coatings inside the containments will be monitored effectively during the period of extended operation. Through periodic visual inspections, the program will continue to detect, evaluate, and correct degraded coatings to assure that the recirculation strainers will not clog from coating debris following a postulated design basis event.

Enclosure 3
Revisions to LRA Sections B2.0 and B2.1.17, and Conforming Changes to Section 3 Regarding the Flow-Accelerated Corrosion Program

The LRA is hereby revised to update the Flow-Accelerated Corrosion Program in the LRA to reflect adoption of the latest EPRI guidance (adds an exception to NUREG-1801) and to provide additional detail. The LRA changes are as follows:

In LRA Table 3.1.1 on Page 3.1-29, the second sentence of the Discussion entry for line item 3.1.1-59 is revised to read, "Exceptions apply to NUREG-1801 recommendations for the Flow-Accelerated Corrosion Program implementation and the Steam Generator Tube Integrity Program implementation."

In LRA Table 3.4.1 on Page 3.4-29, the Discussion entry for line item 3.4.1-29 is revised in its entirety to read, "Consistent with NUREG-1801 with exception. Exceptions apply to NUREG-1801 recommendations for the Flow-Accelerated Corrosion Program implementation. This aging effect is managed with the Flow-Accelerated Corrosion Program."

In the LRA 3.x.2 tables, in all cases where the Flow-Accelerated Corrosion Program is cited as the Aging Management Program, Note A is changed to Note B, and Note C is changed to Note D, as applicable. These changes apply to the following tables:

- Table 3.1.2-5 (Steam Generator System) on Pages 3.1-112, -115, and -123
- Table 3.3.2-11 (Heating System) on Pages 3.3-239, -250, -251 and - 252
- Table 3.4.2-2 (Bleed Steam System) on Pages 3.4-52, -53 and -57
- Table 3.4.2-4 (Condensate System) on Pages 3.4-79 and -86
- Table 3.4.2-5 (Feedwater System) on Pages 3.4-91, -94 and -101
- Table 3.4.2-6 (Main Steam System) on Pages 3.4-104, -107, and -108
- Table 3.4.2-7 (Steam Generator Blowdown System) on Page 3.4-115
- Table 3.4.2-8 (Turbine Generator and Support System) on Pages 3.4-138, -139, -160 and -161

In LRA Section B2.0 on Page B-8, line item XI.M17 of the NUREG-1801 program correlation table is revised to appear as follows:

NUREG-1801 ID	NUREG-1801 Program	PINGP Program	NUREG-1801 Comparison
XI.M17	Flow-Accelerated Corrosion	Flow-Accelerated Corrosion Program [Section B2.1.17]	Existing Program, Consistent with NUREG-1801 with Exception

In LRA Section B2.1.17, Flow-Accelerated Corrosion Program, on Pages B-42 and B-43, the existing section is revised in its entirety to read as follows:

Program Description

The Flow-Accelerated Corrosion (FAC) Program is a condition monitoring program established in accordance with the Electric Power Research Institute (EPRI)

guidelines in Nuclear Safety Analysis Center (NSAC)-202L-R3 for carbon steel and bronze components containing high-energy single phase or two phase fluids. The program manages loss of material due to flow-accelerated corrosion in piping and components by (a) conducting an analysis to determine critical locations, (b) performing baseline inspections to determine the extent of thinning at these locations, and (c) performing follow-up inspections to confirm the predictions of the rate of thinning, or repairing or replacing components as necessary. This program complies with PINGP's response to NRC Generic Letter 89-08.

NUREG-1801 Consistency

The Prairie Island Nuclear Generating Plant Flow-Accelerated Corrosion Program is an existing program. It is consistent, with exceptions, to the recommendations of NUREG-1801, Chapter XI, Program XI.M17, Flow-Accelerated Corrosion.

Exceptions to NUREG-1801

Program Elements Affected

- **Scope of Program, Detection of Aging Effects**

  PINGP implements the guidance provided in EPRI NSAC-202L-R3, "Recommendations for an Effective Flow-Accelerated Corrosion Program," May 2006, in lieu of the NUREG-1801 recommendation of EPRI NSAC-202L-R2, "Recommendations for an Effective Flow-Accelerated Corrosion Program", April 1999. EPRI NSAC-202L-R3 is the most recent revision of this document, and it provides more prescriptive guidance based on the latest industry operating experience. Use of the current guideline is an acceptable method to maintain the FAC-susceptible systems at PINGP.

Enhancements

None

Aging Management Program Elements

The elements of the Flow-Accelerated Corrosion Program are described below. The results of an evaluation of each element with respect to the NUREG-1801, Chapter XI Program XI.M17, Flow-Accelerated Corrosion, are also provided.

Scope of Program

The scope of the PINGP Flow-Accelerated Corrosion (FAC) Program is in accordance with the EPRI guidelines in NSAC-202L-R3 for carbon steel and bronze components containing high-energy single phase or two phase fluids. The program complies with PINGP's response to NRC GL 89-08 and assures

component structural integrity by using procedures, administrative controls and qualified personnel to predict, detect, and monitor wall thinning (loss of material) due to FAC on the internal surfaces of susceptible piping and other components such as fittings, elbows, reducers, expanders, tees, nozzles, heat exchanger components and valve bodies. The program includes (a) conducting an analysis to determine critical locations, (b) performing limited baseline inspections to determine the extent of thinning at these locations, and (c) performing follow-up inspections to confirm the predictions, or repairing or replacing components as necessary. The program uses CHECWORKS to predict component wall thinning and NSAC-202L-R3 to satisfy criteria specified in 10 CFR Part 50, Appendix B, for development of procedures and control of special processes. Susceptible piping and components that can not be adequately modeled in CHECWORKS are qualitatively evaluated, prioritized and ranked based on susceptibility and consequences of failure.

The use of NSAC-202L-R3 is an exception to the NUREG-1801 recommendation which references the use of NSAC-202L-R2. NSAC-202L-R3 is the most recent revision of this document and it provides more prescriptive guidance based on the latest industry operating experience. This revision incorporates lessons learned and new technology that has become available since the previous revision which was published in April 1999. Use of the current guideline is an acceptable method to maintain the FAC-susceptible systems at PINGP.

This AMP consists of PINGP activities that manage aging effects for components of the following systems and/or structures:

- Bleed Steam (BL) System
- Condensate (CD) System
- Feedwater (FW) System
- Heating (HS) System
- Main Steam (MS) System
- Steam Generator Blowdown (SB) System
- Steam Generator (SG) System
- Turbine Generator and Support (TB) System

This element is consistent, with exception, to NUREG-1801, Program XI.M17 Element 1, Scope of Program.

Preventive Actions

The PINGP FAC Program is a predictive analysis, inspection, and verification program; thus, there are no preventive actions. However, secondary water chemistry is monitored to control pH and dissolved oxygen content in accordance with the Water Chemistry Program; and the FAC program includes guidance for the selection of appropriate piping material, geometry, and hydrodynamic conditions, which are all effective means of reducing FAC.

This element is consistent with NUREG-1801, Program XI.M17 Element 2, Preventive Actions.

Parameters Monitored/Inspected

The PINGP FAC Program uses CHECWORKS and qualitative evaluations to predict piping and component wall thinning (loss of material) in susceptible components and uses non-destructive examinations to detect and monitor wall thinning by measuring wall thickness.

This element is consistent with NUREG-1801, Program XI.M17 Element 3, Parameters Monitored/Inspected.

Detection of Aging Effects

The PINGP FAC Program generally uses volumetric ultrasonic examinations to detect and monitor wall thinning (loss of material) in susceptible piping and components. The program also allows for the use of radiography, including the use of radiography for small-bore piping. The program utilizes the guidance of NSAC-202L-R3 and identifies susceptible locations using CHECWORKS as well as qualitative evaluations, industry and plant experience, previous inspection results, operating conditions or special considerations, and engineering judgment. The extent and schedule of the examinations assure detection of wall thinning before the loss of intended function.

The use of NSAC-202L-R3 is an exception to the NUREG-1801 recommendation which references the use of NSAC-202L-R2. EPRI NSAC-202L-R3 is the most recent revision of this document and it provides more prescriptive guidance based on the latest industry operating experience. This revision incorporates lessons learned and new technology that has become available since the previous revision which was published in April 1999. Use of the current guideline is an acceptable method to maintain the FAC-susceptible systems at PINGP.

This element is consistent, with exception, to NUREG-1801, Program XI.M17 Element 4, Detection of Aging Effects.

Monitoring and Trending

The PINGP FAC Program uses CHECWORKS and qualitative evaluations to predict piping and component wall thinning (loss of material) in systems susceptible to FAC using specific plant data, including material, hydrodynamic, and operating conditions. CHECWORKS and the qualitative evaluations provide a bounding predictive analysis for FAC. The inspection schedule is based on the predictive analysis and provides reasonable assurance that structural integrity will be maintained between inspections. The inspection results are evaluated to

determine if additional inspections are needed to determine the extent of wall thinning, assure that the intended function of the component will not be lost, and identify any corrective actions that may be required.

This element is consistent with NUREG-1801, Program XI.M17 Element 5, Monitoring and Trending.

Acceptance Criteria

PINGP inspection results are input into CHECWORKS to calculate the number of refueling outages remaining before the component reaches the minimum allowable wall thickness. If calculations indicate that an area will reach the minimum allowable wall thickness before the next scheduled outage, the component is repaired, replaced, or reevaluated.

This element is consistent with NUREG-1801, Program XI.M17 Element 6, Acceptance Criteria.

Corrective Actions

Components which do not satisfy the PINGP wall thickness acceptance criteria are repaired, replaced, or reevaluated prior to service. Long-term corrective actions include adjusting operating parameters, selecting materials resistant to FAC or improving piping design and configuration. See Section B1.3 for further discussion.

This element is consistent with NUREG-1801, Program XI.M17 Element 7, Corrective Actions.

Confirmation Process, Administrative Controls

These elements are consistent with the corresponding NUREG-1801, Program XI.M17 aging management program elements. See Section B1.3 for further discussion.

Operating Experience

A review of operating experience for the PINGP FAC Program identified no adverse trends or issues with program performance. Wall thinning has been identified, and the associated components replaced, prior to causing any significant impact to safe operation or loss of intended functions. Recent examples of the identification of wall thinning which did not meet acceptance criteria include locations in Heater Drain System line 2 1/2 -2HD-83 elbow and piping in 2005 and Condenser 2A Drain Header at Penetration #75 in 2006. The affected components were replaced. The review of operating experience indicates the PINGP FAC Program is effective in monitoring and detecting

degradation and taking effective corrective actions as needed when acceptance criteria are not met.

This element is consistent with NUREG-1801, Program XI.M17 Element 10, Operating Experience.

Conclusion

The Flow-Accelerated Corrosion Program is an existing program for carbon steel and bronze components containing high-energy single phase or two phase fluids. The program has been effective in predicting, detecting, and monitoring components for FAC; and no adverse trends or significant conditions related to these components have been identified.

Implementation of the Flow-Accelerated Corrosion Program provides reasonable assurance that aging effects will be managed such that structures, systems, and components within the scope of this program will continue to perform their intended function(s) during the period of extended operation.