Xcel Energy®

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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 Inaccessible Medium Voltage Cable Program, Buried Piping and Tanks Inspection Program, Inspection of Steam Generator Divider Plates and Class 1 Small-Bore Piping Program

References:

1. Letter from Nuclear Management Company, LLC (NMC) to the Nuclear Regulatory Commission, "Prairie Island Nuclear Generating Plant Units 1 and 2 – Application for Renewed Operating Licenses," L-PI-08-024, dated April 11, 2008, ADAMS Accession Number ML081130666.

2. Letter from Xcel Energy to the Nuclear Regulatory Commission, "Annual Update of the Application for Renewed Operating Licenses and Supplemental Information Regarding Buried Piping and Tanks Inspection Program and Class 1 Small-Bore Piping Program," L-PI-10-081, dated August 12, 2010, ADAMS Accession Number ML102250265.

By letter dated April 11, 2008 (Reference 1), Nuclear Management Company, LLC (NMC)* 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 regarding the Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program, the

* On September 22, 2008, NMC transferred its operating authority to Northern States Power Company, a Minnesota Corporation (NSPM), doing business as Xcel Energy. By letter dated September 3, 2008, NSPM assumed responsibility for actions and commitments previously submitted by NMC.

Buried Piping and Tanks Inspection Program, and the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program. Supplemental information is also provided related to steam generator divider plate materials and inspections.

Enclosure 1 provides a description of changes to the PINGP Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program. These changes are provided in response to industry operating experience (OE) with buried electrical cables and to address considerations discussed with the NRC during a telephone conference on October 4, 2010. Enclosure 1 also includes revisions to the LRA that reflect changes resulting from the supplemental information provided herein.

Enclosure 2 provides clarification of the PINGP Buried Piping and Tanks Inspection Program previously described in Reference 2. This clarification addresses considerations discussed with the NRC Staff during the October 4, 2010 telephone conference. Enclosure 2 also includes revisions to the LRA that reflect changes resulting from clarifications provided herein.

Enclosure 3 provides information related to the construction materials and inspection of the PINGP steam generator divider plates. This information was requested during the October 4, 2010 telephone conference, and the request was clarified during a telephone conference with the NRC staff on October 27, 2010.

Enclosure 4 provides clarification of the PINGP One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program previously described in Reference 2. This clarification addresses considerations discussed with the NRC Staff during a telephone conference on October 27, 2010. Enclosure 4 also includes revisions to the LRA that reflect changes resulting from clarifications provided herein.

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 a new commitment related to the inspection of divider plates in the PINGP Unit 2 Steam Generators. There are no revisions to existing PINGP License Renewal Commitments as previously submitted; however, Enclosures 1, 2 and 4 describe changes to Aging Management Programs that are being implemented in response to PINGP License Renewal Commitments, numbers 5, 17 and 24, as previously submitted in NSPM letter dated August 7, 2009 (ADAMS Accession number ML092360408).

New License Renewal Commitment No. 45 reads as follows:

> If the original PINGP Unit 2 steam generators are not replaced prior to entry into the period of extended operation, NSPM will perform an inspection of each PINGP Unit 2 steam generator, prior to the period of extended operation, to assess the condition of the divider plates and associated

welds. The examination technique(s) will be capable of detecting PWSCC in the divider plates and associated welds.

A complete listing of PINGP License Renewal Commitments, updated to reflect NSPM correspondence to date, is provided in Enclosure 5.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on November 5, 2010.

Mark A. Schimmel
Site Vice President, Prairie Island Nuclear Generating Plant
Northern States Power Company - Minnesota

Enclosures (5)

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

ENCLOSURE 1

SUPPLEMENTAL INFORMATION – PINGP INACCESSIBLE MEDIUM VOLTAGE CABLES NOT SUBJECT TO 10 CFR 50.49 ENVIRONMENTAL QUALIFICATION REQUIREMENTS PROGRAM

This enclosure provides supplemental information on the Prairie Island Nuclear Generating Plant (PINGP) Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program in support of the License Renewal Application submitted on April 11, 2008 (ADAMS Accession Number ML081130666) by Nuclear Management Company, LLC (NMC). NMC has subsequently transferred its operating authority for PINGP to Northern States Power Company, a Minnesota Corporation (NSPM), doing business as Xcel Energy. This enclosure also contains applicable revisions to License Renewal Application (LRA) appendices to include the supplemental information.

Background

NUREG-1801, Rev. 1, "Generic Aging Lessons Learned," (the GALL Report) addresses inaccessible medium voltage cables in Aging Management Program (AMP) XI.E3, "Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements." The purpose of this program is to provide reasonable assurance that the intended functions of inaccessible medium voltage cables (2kV to 35kV), that are not subject to environmental qualification requirements of 10 CFR 50.49 and are exposed to adverse localized environments caused by moisture while energized, will be maintained consistent with the current licensing basis. The scope of the program applies to inaccessible (in conduits, cable trenches, cable troughs, duct banks, underground vaults or direct buried installations) medium voltage cables within the scope of license renewal and subject to aging management review that are subject to significant moisture simultaneously with significant voltage.

The application of AMP XI.E3 to medium voltage cables was based on the operating experience available at the time Revision 1 of the GALL Report was developed. However, recently identified industry operating experience indicates that the presence of water or moisture can be a contributing factor in inaccessible power cable failures operating at lower service voltages (400V to 2kV). Applicable operating experience (OE) was identified in licensee responses to Generic Letter (GL) 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients." GL 2007-01 included failures of power cables operating at service voltages of less than 2 kV where water was considered a contributing factor.

Recently identified industry OE, provided by the NRC licensees in response to GL 2007-01, has shown that there is an increasing trend of cable failures with length in service beginning in the 6th through 10th years of operation and also that moisture intrusion is the predominant factor contributing to cable failure. The

NRC staff has determined, based on the review of the cable failure distribution, that a combination of annual inspection of manholes and cable testing frequencies of at least every 6 years is a conservative approach to ensuring the operability of power cables and, therefore, should be considered.

In addition, recently identified industry OE has shown that some NRC licensees may experience events, such as flooding or heavy rain, that subject cables within the scope of GALL AMP XI.E3 to significant moisture. The NRC staff has determined that event-driven inspections in addition to a one year periodic inspection frequency, is a conservative approach and, therefore, should be considered.

Issue

The NRC staff has concluded, based on recently identified industry operating experience concerning the failure of inaccessible low voltage power cables (400V to 2kV) in the presence of significant moisture, that these cables can potentially experience age related degradation. The NRC staff noted that the PINGP Inaccessible Medium-Voltage Cables Program does not address inaccessible low voltage power cables (400V (nominally 480V) to 2kV inclusive). In addition, increased cable test and inspection frequencies (six and one years respectively) should be evaluated to ensure that the Inaccessible Medium Voltage Program test and inspection frequencies reflect industry and plant-specific operating experience and that test and inspection frequencies may be increased based on future industry and plant-specific operating experience.

NRC Request 1

Provide a summary of your evaluation of recently identified industry operating experience and any plant-specific operating experience concerning inaccessible low voltage power cable failures within the scope of license renewal (not subject to 10 CFR 50.49 environmental qualification requirements), and how this operating experience applies to the need for additional aging management activities at your plant for such cables.

NSPM Response to Request 1

The PINGP LRA included a discussion of plant-specific OE related to the Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program. The discussion included a summary of the May 8, 2007 PINGP response to NRC Generic Letter 2007-01, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients" (NMC Letter L-PI-07-044, ADAMS Accession Number ML071290142).

In response to NRC Generic Letter 2007-01, a review was performed of the PINGP operating experience to identify failures of inaccessible power cables that were within the scope of 10 CFR 50.65 (the Maintenance Rule). PINGP reported that three underground medium voltage power cable failures had occurred (two circuit failures - one from lightning strike, the other from water intrusion; and one megger test failure). No failures involving low voltage inaccessible cables were reported in the PINGP response to NRC Generic Letter 2007-01.

Additional OE information associated with manhole inspections was provided in NSPM letter L-PI-09-093 dated August 7, 2009 (ADAMS Accession Number ML092360409). That letter reported that there is one manhole at Prairie Island that contains medium voltage cables within the scope of license renewal and subject to periodic inspection for the accumulation of water. This manhole has a floor of gravel and sand approximately 10 feet above the groundwater table, and would drain away any water that might intrude. Multiple manhole inspections performed since September of 2007 have shown no signs of water accumulation.

A review of recent PINGP operating experience was conducted to identify any additional failures of inaccessible low and medium voltage cables that may have occurred from May 2007 to October 2010. The review identified the failure of a 4kV cable (not subject to aging management review) in May of 2009 which supplied a Unit 1 circulating water pump motor. An evaluation of the failed cable concluded that the cable failed due to age related degradation. The evaluation found that the cable had experienced water intrusion during the course of its service life; however, the failure analysis did not conclude that water was the sole cause for the failure. No failures of inaccessible low voltage power cables were identified.

Based on the PINGP specific OE, information provided in the industry responses to NRC Generic Letter 2007-01, as summarized in NRC memorandum from G. Wilson to P. Hiland, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients: Summary Report" (ADAMS Accession Number ML082760385), and recent NRC and Electric Power Research Institute guidance documents, NSPM is modifying the PINGP Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program to include additional aging management activities, as described in our response to NRC Request 2 below.

NRC Request 2

Provide a discussion of how Prairie Island Nuclear Generating Plant will manage the effects of aging on inaccessible low voltage power cables within the scope of license renewal and subject to aging management review, with consideration of

recently identified industry operating experience and any plant-specific operating experience. The discussion should include assessment of your aging management program description, program elements (i.e., Scope of Program, Parameters Monitored/Inspected, Detection of Aging Effects, and Corrective Actions), and FSAR summary description to demonstrate reasonable assurance that the intended functions of inaccessible low voltage power cables subject to adverse localized environments will be maintained consistent with the current licensing basis through the period of extended operation.

NSPM Response to Request 2

Based on the industry and PINGP specific OE discussed in our response to NRC Request 1, NSPM is modifying the PINGP Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program, as described below:

- The Scope of Program is expanded to include inaccessible low voltage (400V to 2kV) power cables that are within the scope of license renewal and are exposed to significant moisture. Significant moisture is defined as periodic exposures to moisture that last more than a few days (e.g., cable wetting or submergence in water). Inaccessible cables at PINGP are located in underground ducts or direct buried, and as such have the potential to be exposed to significant moisture, therefore, inaccessible low and medium voltage power cables within the scope of this program are subject to testing.

- The Scope of Program is revised to delete the criterion of "exposure to significant voltage" (system voltage for more than 25% of the time) associated with inaccessible medium voltage (2 kV to 35 kV) power cables that are within the scope of license renewal.

- The Scope of Program is expanded to include the inspection of pull boxes with conduit ends associated with inaccessible low and medium voltage power cables within the scope of license renewal for the accumulation of water, and draining of water, if necessary. The configuration of the in-scope pull boxes and associated conduit will be evaluated, and pull boxes where water would be expected to accumulate, will be periodically inspected. The pull box inspection frequency will be based on actual plant experience with water accumulation; however, the inspection frequency will be at least once per year.

- The Preventive Actions required by the program are changed to include the inspection of pull boxes for the accumulation of water, and draining of water, if necessary.

- The Parameters Monitored/Inspected, as required by the program, are changed to include the inspection of pull boxes for the accumulation of water, and draining of water, if necessary. The Parameters Monitored/Inspected are also changed to include the performance of manhole and pull box inspections following a flooding event where the river level reaches an elevation where water intrusion might be expected to occur.

- The Detection of Aging Effects required by the program is changed to include inaccessible low voltage power cables that are within the scope of license renewal. Inaccessible low voltage power cables will be tested for degradation of the cable insulation at least once every six years. The frequency for testing of inaccessible medium voltage power cables that are within the scope of license renewal and exposed to significant moisture is revised from at least once every ten years to at least once every six years.

- The Detection of Aging Effects required by the program is also changed to include the annual inspection of pull boxes for the accumulation of water, and draining of water, if necessary, and to include the performance of manhole and pull box inspections following a flooding event where the river level reaches an elevation where water intrusion might be expected to occur. The manhole inspection frequency is revised from at least once every two years to at least once every year.

- Monitoring and Trending element of the program does not change. If opportunities for trending become available, trending will be used as a performance tool.

- The Acceptance Criteria element of the program is changed to refer to event based manhole and pull box inspections.

- The Corrective Actions element of the program is changed to include inaccessible low voltage (400V to 2kV) power cables and pull box inspections. The Corrective Actions element is also changed to state that event based inspections will also be considered should the initial or subsequent inspections indicate that water intrusion may be occurring as the result of external events such as heavy rain.

- The Confirmation Process and Administrative Controls program elements do not change.

- The Operating Experience program element is expanded to include the May 2009 4kV cable failure discussed in the response to NRC Request 1 above.

The modifications to the PINGP Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program

described above will provide additional assurance that the intended functions of inaccessible low and medium voltage power cables in the scope of license renewal and exposed to significant moisture will be maintained consistent with the current licensing basis through the period of extended operation.

NRC Request 3

Provide an evaluation showing that the Inaccessible Medium Voltage Program test and inspection frequencies, including event driven inspections, incorporate recent industry and plant-specific operating experience for both inaccessible low and medium voltage cable. Discuss how the Inaccessible Medium Voltage Program will ensure that future industry and plant-specific operating experience will be incorporated into the program such that inspection and test frequencies may be increased based on test and inspection results.

NSPM Response to Request 3

NSPM had previously committed to a cable test frequency of at least every ten years and a manhole inspection frequency of at least every two years. By this letter, NSPM is adopting a more conservative cable test frequency of at least every six years and a manhole and pull box annual inspection frequency. The reduction of the ten year test and two year inspection intervals is based on PINGP specific OE, information provided in the industry responses to NRC Generic Letter 2007-01, as summarized in NRC memorandum from G. Wilson to P. Hiland, "Inaccessible or Underground Power Cable Failures that Disable Accident Mitigation Systems or Cause Plant Transients: Summary Report" (ADAMS Accession Number ML082760385), and is consistent with NRC staff recommendations.

The program requires an assessment be performed when the test acceptance criteria are not met in order to ensure that the intended functions of the insulated cables used in low and medium voltage circuits can be maintained consistent with the current licensing basis. The assessment would include the significance of the test results, the operability of the component, the reportability of the event, the extent of the concern, the potential cause for not meeting the test criteria, the corrective actions required, and the likelihood of recurrence. When an unacceptable condition or situation is identified, a determination is made as to whether the same condition or situation is applicable to other inaccessible low and medium voltage cables that are subject to aging management review and whether additional testing or an increased testing frequency should be considered.

The annual manhole frequency is justified based on PINGP plant specific operating experience and the manhole configuration. However, should the

annual inspections identify water intrusion; the inspection frequency would be adjusted as necessary to minimize the impact on the inaccessible cable.

To address concerns with respect to water intrusion into the medium voltage cable manhole resulting from river flood conditions, the PINGP abnormal operating procedure which describes actions taken in response to river flooding includes a requirement to initiate the performance of a manhole inspection if the river level reaches an elevation (greater than 688 feet) where water intrusion into the manhole might be expected to occur.

The area around the medium voltage cable manhole subject to aging management review is not prone to significant water accumulation during heavy rains, and the manhole opening is located above the surrounding grade so significant drainage into the manhole would not be expected to occur. Rain may result in some water entering the manhole from around the manhole cover, however, the amount would not be expected to be significant, and the manhole configuration (gravel and sand bottom) would mitigate any long term accumulation of water. As a result, an inspection of the manhole is not deemed necessary following a heavy rain event.

To address concerns with respect to water intrusion into pull boxes and associated conduit containing in-scope inaccessible low and medium voltage power cables resulting from river flood conditions, pull box inspections will be performed if the river level reaches an elevation where water intrusion into pull boxes or associated conduit within the scope of license renewal might be expected to occur.

The initial pull box inspections to be conducted prior to the period of extended operation will provide baseline information which will be used to establish the frequency of future inspections. Should the initial inspections find evidence of water intrusion, the inspection frequency would be adjusted as necessary to ensure the integrity of the affected cables. However, the inspection frequency will be at least once per year. Event based inspections of pull boxes would also be considered should the initial and subsequent inspections indicate that water intrusion may be occurring as the result of external events such as heavy rain.

PINGP has a comprehensive OE Program that monitors industry issues/events and assesses these for applicability to its own operations. In addition, the PINGP Corrective Action Program (CAP) is used to track, trend and evaluate plant issues/events. Those issues and events, whether external or plant specific, that are potentially significant to the Inaccessible Medium Voltage Cables Not Subject To 10 CFR 50.49 Environmental Qualification Requirements Program at PINGP are evaluated. The Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program would be modified, as

appropriate, if these evaluations show that program changes would enhance program effectiveness.

Using the OE Program and CAP to focus on industry and plant operating experience ensures that Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program issues are addressed in a timely manner and that age related deterioration of cables and connections within the scope of the program will be effectively managed throughout the license renewal period.

Amendment to LRA

Based upon the aging management program revisions outlined above, the PINGP LRA is amended as described below.

LRA Appendix A, Section A2.21, on Pages A-9 and A-10, is deleted and replaced in its entirety with the following:

A2.21 **Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program**

The Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program performs periodic tests to provide an indication of the condition of the conductor insulation for inaccessible low and medium voltage (operating at greater than or equal to 400V) power cables within the scope of license renewal and exposed to long periods of high moisture (greater than a few days at a time). This program includes inaccessible low and medium voltage power cables (direct buried or in underground ducts) not designed for wet environments. Insulation testing for the affected cables is performed at least once every six years, with the first tests completed prior to the period of extended operation.

The program also includes periodic manhole and pull box inspections for the accumulation of water, and draining of water, if necessary. Manhole and pull box inspections are performed at least once every year, with the first inspection completed before the period of extended operation. Manhole and pull box inspections are also performed following a flooding event where the river level reaches an elevation where water intrusion might be expected to occur.

This program will be implemented prior to the period of extended operation.

In LRA Appendix B, Section B2.1.21, on Pages B-50 and B-51, the Program Description and Conclusion sections are deleted and replaced in their entirety with the following:

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

Program Description

The Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program manages the effects of aging resulting from the wetting or submergence of inaccessible low and medium voltage power cables (operating at greater than or equal to 400V) within the scope of license renewal. The program manages the effects of aging through the performance of periodic testing of inaccessible low and medium voltage power cables within the scope of license renewal and exposed to significant moisture. Significant moisture is defined as periodic exposures to moisture that last more than a few days (e.g., cable wetting or submergence in water). Inaccessible cables at PINGP are located in underground ducts or direct buried, and as such have the potential to be exposed to significant moisture, therefore, inaccessible low and medium voltage power cables within the scope of this program are subject to testing.

The program will test the inaccessible low and medium voltage power cables within the scope of license renewal and exposed to significant moisture to provide an indication of the condition of the conductor insulation. The testing performed will be a proven test for detecting deterioration of the insulation system due to wetting or submergence. Testing of the inaccessible low and medium voltage power cables within the scope of license renewal and exposed to significant moisture is performed at least once every six years. The first tests for License Renewal are to be completed before the period of extended operation.

The program also includes actions to limit the exposure of in-scope inaccessible low and medium voltage power cable to long term significant moisture through periodic manhole and pull box inspections for water accumulation, and draining of water, as needed. The inspection frequency will be based on actual plant experience with water accumulation. However, the inspection frequency will be at least once per year. The first inspection for License Renewal will be completed before the period of extended operation. Manhole and pull box inspections are also performed following a flooding event where the river level reaches an elevation where water intrusion might be expected to occur.

This program considers the technical guidance provided in NUREG/CR-5643, IEEE Std. P1205, SAND96-0344, and EPRI TR-109619.

Conclusion

The Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program is a new program that implements periodic tests on inaccessible non-EQ low and medium voltage power cables within the scope of License Renewal and exposed to wetting or submergence.

Implementation of the Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program provides reasonable assurance that aging effects will be managed such that electrical cables within the scope of this program will continue to perform their intended function(s) during the period of extended operation.

This program will be implemented prior to the period of extended operation.

ENCLOSURE 2

SUPPLEMENTAL INFORMATION – PINGP BURIED PIPING AND TANKS INSPECTION PROGRAM

This enclosure provides supplemental information on the Prairie Island Nuclear Generating Plant (PINGP) Buried Piping and Tanks Inspection Program in support of the License Renewal Application submitted on April 11, 2008 (ADAMS Accession Number ML081130666) by Nuclear Management Company, LLC (NMC). NMC has subsequently transferred its operating authority for PINGP to Northern States Power Company, a Minnesota Corporation (NSPM), doing business as Xcel Energy. This enclosure also contains applicable revisions to License Renewal Application (LRA) appendices to include the supplemental information.

NSPM letter L-PI-10-081 dated August 12, 2010 (ADAMS Accession Number ML102250265) provided supplemental information related to the PINGP Buried Piping and Tanks Inspection Program. In a conference call on October 4, 2010, the NRC requested clarification of some of the information provided in the August 12, 2010 letter. As a result, NSPM is modifying LRA Sections A2.8 and B2.1.8, which describe the PINGP Buried Piping and Tanks Inspection Program, to provide the requested clarification.

Examination from Interior of Piping

Background

In the Annual LRA Update dated August 12, 2010, Supplemental Information Regarding Buried Piping and Tanks Inspection Program, the applicant stated that they will excavate and inspect a buried pipe segment in each system which includes in-scope buried pipe. The applicant also stated that, "Volumetric examination methods (e.g., ultrasonic techniques) from the interior of the component may be substituted for excavation and direct visual examination of buried components where the physical configuration and/or field conditions allow for effective assessment by such means." Additionally, the revised Updated Safety Analysis Report (USAR) Supplement, A2.8 states, "Volumetric examination methods (e.g., ultrasonic techniques) from the interior of the components may be substituted for excavation and direct visual examination of the external surfaces of buried components." Generic Aging Lessons Learned (GALL) Aging Management Program (AMP) XI.M34 element "parameters monitored/inspected" does not provide for an internal examination alternative and thus the applicant's proposal is an exception to the GALL Report.

Issue

The staff believes that there is a minimum set of excavated and visual inspections of buried piping segments that should be conducted to establish a reasonable basis of assurance that aging effects are not adversely impacting buried pipe. The staff also believes that where examining buried pipe from the exterior surface is not possible due

to plant configuration (e.g., the piping is located underneath foundations) it is reasonable to substitute a volumetric examination from the interior of the pipe provided the surface is properly prepared. However, the staff does not believe that using volumetric examinations as a substitute for excavated visual inspections whenever, "the physical configuration and/or field conditions allow for effective assessment by such means" is appropriate. Additionally, beyond ultrasonic techniques, the staff is not aware of another reliable volumetric inspection methodology that is suitable for inspecting buried in scope piping.

NRC Request 1

State whether volumetric examination methods from the interior of the component will only be substituted for excavation and direct visual examination of buried components where the physical configuration does not allow the buried piping segment to be excavated and visually inspected, or justify why it is acceptable to utilize volumetric examination methods in place of excavation and direct visual inspection in instances where the pipe is accessible for excavation and direct visual examination.

NSPM Response to Request 1

The PINGP Buried Piping and Tanks Inspection Program is revised to state that examination from the interior of piping may only be utilized when excavation and direct visual examination of the external surfaces of buried piping is not possible due to plant configuration.

NRC Request 2

State what alternative volumetric examination methods, beyond ultrasonic examinations, will be utilized for conducting an interior wall thickness measurement when not excavating and visually inspecting a buried piping segment, and justify why they will be effective at providing a reasonable assurance that the buried in-scope piping systems will meet their current licensing basis function.

NSPM Response to Request 2

The PINGP Buried Piping and Tanks Inspection Program is revised to state that ultrasonic methods will be used for examinations from the interior of piping.

NRC Request 3

If a volumetric examination method is used, what percentage of interior axial length of the pipe will be inspected?

NSPM Response to Request 3

The PINGP Buried Piping and Tanks Inspection Program is revised to state that when ultrasonic testing from the piping interior is employed, at least 25% of the buried piping in the affected system will be inspected for loss of material.

Cathodic Protection

Background

In the Annual LRA Update dated August 12, 2010, Supplemental Information Regarding Buried Piping and Tanks Inspection Program, USAR Update, Section A2.8, the applicant stated that, "A cathodic protection system is provided as an additional preventive measure in accordance with NACE International standards."

Issue

The staff notes that NACE SP0169-2007, Section 10.3, states that surveys demonstrating the effectiveness of the cathodic protection system should be conducted annually. The staff also notes that the standard allows for undefined longer or shorter intervals for monitoring depending on the variability of cathodic protection factors, safety considerations, and economics of monitoring. The staff believes that, from an aging management perspective, it would not normally be appropriate to extend the intervals between surveys beyond an annual basis due to the importance of ensuring that the appropriate protection is provided to the buried piping, obtaining trending data on cathodic protection field output and locating potential coating holidays. Based on the information provided in the Annual LRA Update letter, it is not clear how often the applicant intends to conduct surveys.

NRC Request

Clarify the periodicity of conducting NACE potential surveys, and if not annual, justify the proposed periodicity in light of ensuring appropriate protection is provided to the buried piping, trending data is obtained on cathodic protection field output, and potential coating holidays are located.

NSPM Response

As stated on page 2 of Enclosure 1 of NSPM letter L-PI-10-081 dated August 12, 2010 (ADAMS Accession Number ML102250265), "On an annual basis, the cathodic protection system is surveyed to assess the continued effectiveness of the corrosion protection afforded by the system." The annual assessment includes the measurement of component-to-soil potentials, in accordance with NACE International standards.

The PINGP Buried Piping and Tanks Inspection Program, as described in LRA Sections A2.8 and B2.1.8, are revised to state that cathodic protection system potential surveys are performed at least annually in accordance with NACE International standards.

Buried Tank Inspection

Background

The response to RAI B2.1.19-3 stated that there are seven in-scope buried diesel fuel oil storage tanks. In the Annual LRA Update dated August 12, 2010, Supplemental Information Regarding Buried Piping and Tanks Inspection Program, the applicant stated that they will inspect three buried tanks within the scope of the program in the ten years preceding the period of extended operation. The applicant also stated that a minimum of three buried tanks will be inspected periodically on a ten year interval.

Issue

The staff believes that buried tank inspections are a critical aspect of a preventive and condition monitoring program to ensure that the tanks do not leak hazardous material to the environment and are capable of performing their current licensing basis function. Based on the information provided in the two referenced documents, it is not clear whether all seven in-scope tanks will be inspected over the thirty year period starting ten years prior to the period of extended operation.

Request

Clarify how the inspections of buried in-scope tanks will be tracked to prevent repeated inspections of a single tank (unless inspections results so dictate) and to ensure that all seven tanks will be inspected over the thirty year period starting ten years prior to the period of extended operation or justify why it is acceptable not to inspect each tank.

NSPM Response

The PINGP Buried Piping and Tanks Inspection Program is revised to state that the program will ensure that all seven buried fuel oil tanks will be inspected over the thirty year period starting ten years prior to the period of extended operation.

Fuel Oil Piping

Background

In the Annual LRA Update dated August 12, 2010, Supplemental Information Regarding Buried Piping and Tanks Inspection Program, the applicant stated that in the ten year period prior to the start of extended operation they will excavate and inspect a ten foot segment of in-scope buried diesel fuel oil piping.

Issue

Based on the information provided in the LRA, the staff does not have enough information to determine what percentage of the total linear feet of buried in-scope diesel fuel oil piping will be inspected by virtue of completing the planned inspection of a ten foot segment of piping.

Request

State the percent of total linear feet of buried in-scope diesel fuel oil piping that will be inspected during the excavation and inspection of a ten foot segment of the piping.

NSPM Response

A plant drawing review determined that ten feet of fuel oil piping represents approximately 0.44% of all buried fuel oil piping within the scope of license renewal. Note that approximately 13% of the buried fuel oil piping within the scope of license renewal is hydrostatically tested on a three year interval. While this testing is not credited in the PINGP License Renewal Buried Piping and Tanks Inspection Program, it does provide additional assurance of the integrity of the fuel oil piping within the scope of license renewal.

Additional Program Description Changes

NSPM is also modifying the PINGP Buried Piping and Tanks Inspection Program description in LRA Section B2.1.8 to make the following clarifications:

- The program description is modified to state that the initial inspections conducted within the ten years prior to the period of extended operation will include at least one buried piping segment in each system within the scope of the program. This change is made to clarify that the initial inspections conducted prior to the period of extended operation will only examine buried piping in systems within the scope of the program.

- The conclusion is revised to state that the program maintains the cathodic protection system at a minimum system availability of 90%.

Amendment to LRA

Based upon the aging management program revisions discussed above, the PINGP LRA is amended as described below. The LRA changes provided below supersede the changes to LRA Sections A2.8 and B2.1.8 provided by NSPM letter L-PI-10-081 dated August 12, 2010 (ADAMS Accession Number ML102250265).

LRA Appendix A, Section A2.8, on Page A-5, is deleted and replaced in its entirety with the following:

A2.8 Buried Piping and Tanks Inspection Program

The Buried Piping and Tanks Inspection Program manages loss of material on the external surfaces of carbon steel and cast iron components that are buried in soil or sand. As a preventive measure, buried pipe is coated and wrapped prior to initial installation in accordance with standard industry practices to prevent/mitigate corrosion. A cathodic protection system is provided as an additional preventive measure, and is maintained at a minimum system availability of 90%. Cathodic protection system potential surveys are performed at least annually in accordance with NACE International standards.

The program performs visual inspections following excavation of external surfaces of buried piping and associated components (e.g., bolting) for evidence of coating damage and degradation of the underlying carbon steel and cast iron. If no evidence of damage to the coating or wrapping is detected, then the coating or wrapping will not be removed for further inspection. Where excavation and direct visual examination of the external surfaces of buried piping is not possible due to plant configuration, ultrasonic examination from the interior may be substituted. When ultrasonic testing from the interior is employed, at least 25% of the buried piping in the affected system will be inspected for loss of material.

Piping inspection locations are based upon a quantitative risk assessment as well as opportunities for inspection, such as scheduled maintenance work requiring excavation. A representative sample of buried piping, including a minimum of four inspection locations, is inspected every ten-year period of the license renewal term. Initial inspections, conducted within the ten years prior to the period of extended operation, will include at least one buried piping segment in each system within the scope of the program. Each inspection will include a minimum of ten linear feet of piping.

Buried tanks are periodically inspected for loss of material using ultrasonic inspection or other suitable examination technique. A minimum of three tank inspections are performed once every ten years, with three tanks inspected in the ten years preceding the period of extended operation. The program will ensure that all seven buried fuel oil tanks will be inspected over the thirty year period starting ten years prior to the period of extended operation.

This program will be implemented prior to the period of extended operation.

In LRA Appendix B, Section B2.1.8, on Pages B-25 through B-27, the Program Description and Conclusion sections are deleted and replaced in their entirety with the following:

B2.1.8 Buried Piping and Tanks Inspection Program

Program Description

The Buried Piping and Tanks Inspection Program manages loss of material on the external surfaces of carbon steel and cast iron components that are buried in soil or sand. As a preventive measure, buried pipe is coated and wrapped prior to initial installation in accordance with standard industry practices to prevent/mitigate corrosion. A cathodic protection system is provided as an additional preventive measure, and is maintained at a minimum system availability of 90%. Cathodic protection system potential surveys are performed at least annually in accordance with NACE International standards.

The program performs visual inspections following excavation of external surfaces of buried piping and associated components (e.g., bolting) for evidence of coating damage and degradation of the underlying carbon steel and cast iron. If no evidence of damage to the coating or wrapping is detected, then the coating or wrapping will not be removed for further inspection. Where excavation and direct visual examination of the external surfaces of buried piping is not possible due to plant configuration, ultrasonic examination from the interior may be substituted. When ultrasonic testing from the interior is employed, at least 25% of the buried piping in the affected system will be inspected for loss of material.

The program includes a quantitative risk assessment of all buried piping. An overall risk factor is computed for each zone of buried pipe. The risk factor is based upon such attributes as coating condition, cathodic protection system assessments, and the consequence of leakage. The overall risk factor is used to determine relative priorities and locations of initial inspections and future (periodic) inspections. Inspections may also be conducted as opportunities arise, such as during scheduled maintenance work requiring excavation. A representative sample of buried piping, including a minimum of four inspection locations, is inspected every ten-year period of the license renewal term. Initial inspections, conducted within the ten years prior to the period of extended operation, will include at least one buried piping segment in each system within the scope of the program. Each inspection will include a minimum of ten linear feet of piping.

The program scope includes seven buried fuel oil storage tanks. The tanks are periodically inspected for loss of material using ultrasonic inspection or other suitable examination technique. A minimum of three tank inspections are

performed once every ten years, with three tanks inspected in the ten years preceding the period of extended operation. The program will ensure that all seven buried fuel oil tanks will be inspected over the thirty year period starting ten years prior to the period of extended operation.

The Buried Piping and Tanks Inspection Program assures that the effects of aging on buried piping, tanks and miscellaneous components are being effectively managed for the period of extended operation. Any evidence of damage to the coating or wrapping, such as coating perforation, holidays, or other damage, will cause the protected component to be inspected for evidence of loss of material. Following the inspection of the external surface of the exposed component, the coating or wrap will be repaired to restore the preventive attributes.

Conclusion

The Buried Piping and Tanks Inspection Program is a new program that will perform inspections on external surfaces of carbon steel and cast iron components that are buried in soil or sand. The program also maintains the cathodic protection system at a minimum system availability of 90%. Implementation of the Buried Piping and Tanks Inspection 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.

This program will be implemented prior to the period of extended operation.

ENCLOSURE 3

SUPPLEMENTAL INFORMATION – PINGP STEAM GENERATOR DIVIDER PLATES

This enclosure provides supplemental information related to aging management of the Prairie Island Nuclear Generating Plant (PINGP) steam generator divider plates in support of the License Renewal Application submitted on April 11, 2008 (ADAMS Accession Number ML081130666) by Nuclear Management Company, LLC (NMC). NMC has subsequently transferred its operating authority for PINGP to Northern States Power Company, a Minnesota Corporation (NSPM), doing business as Xcel Energy.

Background

SRP-LR Section 3.1.2.2.13 identifies that cracking due to primary water stress corrosion cracking (PWSCC) could occur in pressurized water reactor components made of nickel alloy and steel with nickel alloy cladding, including reactor coolant pressure boundary components and penetrations inside the reactor coolant system such as pressurizer heater sheathes and sleeves, nozzles, and other internal components. Generic Aging Lessons Learned (GALL) Report Volume 2 Item IV.D1-06 recommends Chapter XI.M2, "Water Chemistry," for PWR primary water, to manage the aging effect of cracking in the nickel alloy steam generator (SG) divider plate exposed to reactor coolant.

License Renewal Application Table 3.1.1, Item 81, credits the Water Chemistry Program to manage cracking due to primary stress corrosion cracking in nickel-alloy steam generator primary channel head divider plates exposed to reactor coolant in the steam generators, and LRA Table 3.1.1, Item 82, indicates that the steam generator primary side divider plates for both Units 1 and 2 are fabricated from nickel alloy.

Unit 1 USAR Table 4.1-1 states that the divider plate is made with Alloy 690 for the Unit 1 replacement Framatome steam generators.

Unit 2 USAR Table 4.1-1 describes the construction materials for the original Westinghouse steam generators. The staff noted that there is no information about the construction materials of the divider plate assembly for the Unit 2 steam generators.

Issue

From foreign operating experience in steam generators with a similar design to that of Prairie Island Units 1 and 2 steam generators, extensive cracking due to PWSCC has been identified in SG divider plate assemblies made with Alloy 600, even with proper primary water chemistry. Specifically, cracks have been detected in the stub runner, very close to the tubesheet/stub runner weld and with depths of almost a third of the divider plate thickness. Therefore, the staff noted that the Water Chemistry Program may not be effective in managing the aging effect of cracking due to PWSCC in SG divider plate assemblies.

Although these SG divider plate assembly cracks may not have a significant safety impact in and of themselves, such cracks could affect adjacent items that are part of the reactor coolant pressure boundary, such as the tubesheet and the channel head, if they propagate to the boundary with these items. For the tubesheet, PWSCC cracks in the divider plate could propagate to the tubesheet cladding with possible consequences to the integrity of the tube-to-tubesheet welds. For the channel head, the PWSCC cracks in the divider plate could propagate to the SG triple point and potentially affect the pressure boundary of the SG channel head.

NRC Request (1).a

Clarify whether all the components for your Unit 1 replacement SG divider plate assemblies, including the welds within these assemblies and to the channel head and to the tubesheet, are fabricated with Alloy 690 (or the associated weld materials).

NSPM Response to Request (1).a

The materials used in the fabrication of the PINGP Unit 1 replacement steam generator divider plates and associated welds are:

- Divider Plate - Inconel Alloy 690
- Stub weld buildup on tubesheet - Inconel Weld Material 152
- Weld material between stub and divider plate - Inconel Weld Material 152
- Weld material between channel head and divider plate - 308L-316 Stainless Steel

The Unit 2 replacement steam generators are being fabricated from the same materials.

NRC Request (1).b

Describe the construction materials of your Unit 2 SG divider plate assemblies, including the welds within these assemblies and to the channel head and to the tubesheet.

NSPM Response to Request (1).b

The materials used in the fabrication of the divider plates and associated welds in the original PINGP Unit 2 steam generators are:

- Divider Plate - Inconel Alloy 600
- Weld material (divider plate to tubesheet and channel head) - Inconel Weld Material 182

NRC Request (2)

If any constitutive/weld material of the SG divider plate assemblies is susceptible to cracking (e.g., Alloy 600 or the associated Alloy 600 weld materials), please describe an inspection program (examination technique and frequency) to ensure that there are no cracks propagating into other items which are part of the reactor coolant pressure boundary (e.g., tubesheet and channel head) that could challenge the integrity of those adjacent items.

NSPM Response to Request (2)

As stated in our response to NRC Request (1).b above, the divider plates and associated welds in the original PINGP Unit 2 steam generators were fabricated from Alloy 600 and the associated Alloy 600 weld materials. However, replacement Unit 2 steam generators are currently in fabrication and are scheduled for installation during the last Unit 2 refueling outage prior to the period of extended operation. As such, no inspection of the original Unit 2 steam generator divider plates and associated welds is deemed necessary prior to the period of extended operation. However, should the installation of the replacement Unit 2 steam generators not occur prior to the period of extended operation, NSPM will perform an inspection of each PINGP Unit 2 steam generator, prior to the period of extended operation, to assess the condition of the divider plates and associated welds. The examination technique(s) will be capable of detecting PWSCC in the divider plates and associated welds. NSPM makes the following new Commitment No. 45:

> If the original PINGP Unit 2 steam generators are not replaced prior to entry into the period of extended operation, NSPM will perform an inspection of each PINGP Unit 2 steam generator, prior to the period of extended operation, to assess the condition of the divider plates and associated welds. The examination technique(s) will be capable of detecting PWSCC in the divider plates and associated welds.

Because the Unit 1 and Unit 2 replacement steam generator divider plates and associated welds utilize Alloy 690 and the associated Alloy 690 weld material, no inspection of the replacement steam generator divider plates and associated welds is required.

ENCLOSURE 4

SUPPLEMENTAL INFORMATION – PINGP ONE-TIME INSPECTION OF ASME CODE CLASS 1 SMALL-BORE PIPING PROGRAM

This enclosure provides supplemental information on the Prairie Island Nuclear Generating Plant (PINGP) One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program in support of the License Renewal Application submitted on April 11, 2008 (ADAMS Accession Number ML081130666) by Nuclear Management Company, LLC (NMC). NMC has subsequently transferred its operating authority for PINGP to Northern States Power Company, a Minnesota Corporation (NSPM), doing business as Xcel Energy. This enclosure also contains applicable revisions to License Renewal Application (LRA) appendices to include the supplemental information.

NSPM letter L-PI-10-081 dated August 12, 2010 (ADAMS Accession Number ML102250265) provided supplemental information related to the PINGP One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program. During a telephone conference between NRC and NSPM staff members on October 27, 2010, the NRC staff requested clarification of some of the information provided in the August 12, 2010 NSPM letter. As a result, NSPM is modifying LRA Sections A2.30 and B2.1.30, which describe the PINGP One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program, to provide the requested clarification.

NRC Request

Provide the population of Code Class 1 small-bore socket welds for each PINGP Unit.

Clarify the plan for the one-time inspection of Code Class 1 small-bore socket welds utilizing volumetric techniques.

Clarify the total number of Code Class 1 small-bore socket welds that will be included in the inspection should the option of performing destructive examinations be chosen.

NSPM Response

In accordance with the examination requirements of ASME Section XI, Table IWB-2500-1, Examination Category B-J, the population of Code Class 1 socket welds within the scope of the PINGP Class 1 Small-Bore Piping Program includes (50) small-bore socket welds in Unit 1 and (84) small-bore socket welds in Unit 2. This weld population is limited to Class 1 piping that is less than 4 inch and greater than 1 inch nominal pipe size (NPS).

The program is revised to clarify the applicability of the PINGP One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program to piping 1 inch NPS and smaller. As specified in IWB-1220, piping 1 inch NPS and smaller is exempt from the volumetric and surface examination requirements of ASME Section XI, Table IWB-2500-1, Examination

Category B-J. Consistent with this inservice inspection methodology, the scope of the PINGP Class 1 Small-Bore Piping Program is limited to Class 1 piping that is less than 4 inch NPS and greater than 1 inch NPS.

The PINGP One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program is clarified to require one-time volumetric examinations of 3% of the Code Class 1 small-bore socket welds in each of the PINGP Units. Based on the population of welds in each Unit, two welds will be examined in PINGP Unit 1 and three welds will be examined in PINGP Unit 2.

The PINGP One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program is clarified to require two socket welds per Unit to be destructively examined for the presence of cracking in lieu of the five volumetric examinations in the event that a qualified socket weld inspection methodology is not available prior to the period of extended operation.

Amendment to LRA

Based upon the aging management program revisions discussed above, the PINGP LRA is amended as described below. The LRA changes provided below supersede the changes to LRA Sections A2.30 and B2.1.30 provided by NSPM letter L-PI-10-081 dated August 12, 2010 (ADAMS Accession Number ML102250265).

LRA Appendix A, Section A2.30, on Page A-13, is deleted and replaced in its entirety with the following:

A2.30 **One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program**

The One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program is a condition monitoring program that provides additional assurance that aging of Class 1 small-bore piping either is not occurring or is insignificant, such that a new plant-specific aging management program is not warranted. The program inspects for the presence of cracking by performing one-time volumetric examinations on a sample of butt welds and socket welds in Class 1 piping (including pipes, fittings, and branch connections) less than 4-inch nominal pipe size (NPS) and greater than 1 inch NPS. The one-time inspections are performed at locations that are determined to be potentially susceptible to cracking based upon the methodology of the site-specific, NRC-approved, Risk-Informed Inservice Inspection Program.

In the event that a qualified socket weld inspection methodology is not available prior to the period of extended operation, two socket welds per Unit will be destructively examined for the presence of cracking in lieu of the volumetric examinations.

This program will be completed prior to the period of extended operation.

In LRA Appendix B, Section B2.1.30, on Page B-63, the Program Description is deleted and replaced in its entirety with the following:

B2.1.30 **One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program**

Program Description

The One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program (Class 1 Small-Bore Piping Program) is a condition monitoring program that provides additional assurance that aging of Class 1 small-bore piping either is not occurring or is insignificant, such that a new plant-specific AMP is not warranted.

The Class 1 Small-Bore Piping Program inspects for the presence of cracking by performing one-time volumetric examinations on a sample of butt welds and socket welds in Class 1 small-bore piping (including pipes, fittings, and branch connections). As specified in IWB-1220, piping 1 inch nominal pipe size (NPS) and smaller is exempt from the volumetric and surface examination requirements of ASME Section XI, Table IWB-2500-1, Examination Category B-J. Consistent with this inservice inspection methodology, the scope of the PINGP Class 1 Small-Bore Piping Program is limited to Class 1 piping that is less than 4 inch NPS and greater than 1 inch NPS. The one-time inspections are performed at locations that are determined to be potentially susceptible to cracking, based on the methodology of the site-specific, NRC-approved, Risk-Informed Inservice Inspection Program.

The program includes one-time volumetric examinations of five ASME Class 1 socket welds, two on Unit 1 and three on Unit 2. Volumetric examinations are conducted using a qualified inspection methodology that can accurately detect discontinuities within the specified examination volume, if available. Two socket welds per Unit will be destructively examined for the presence of cracking in lieu of the five volumetric examinations in the event that a qualified socket weld inspection methodology is not available prior to the period of extended operation.

Based upon a review of previous operating experience, PINGP has not experienced cracking of ASME Code Class 1 small-bore piping. If evidence of aging-related cracking is identified through the implementation of the Class 1 Small-Bore Piping Program, a periodic inspection program will be implemented to manage applicable aging effects during the period of extended operation.

Enclosure 5

Prairie Island Nuclear Generating Plant License Renewal Commitments

17 Pages to Follow

Enclosure 5
Prairie Island Nuclear Generating Plant License Renewal Commitments

The following table provides the list of commitments included in the Application for Renewed Operating Licenses (LRA) for Prairie Island Nuclear Generating Plant (PINGP) Units 1 and 2, as updated in subsequent correspondence.

The commitments in this list are anticipated to be the final commitments which will be confirmed in the NRC's Safety Evaluation Report (SER) for the renewed operating licenses. These commitments, as confirmed in the SER, will become effective upon NRC issuance of the renewed licenses. In addition, as stated in the LRA, the final commitments will be incorporated into the Updated Safety Analysis Report (USAR).

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
1	Each year, following the submittal of the PINGP License Renewal Application and at least three months before the scheduled completion of the NRC review, NMC will submit amendments to the PINGP application pursuant to 10 CFR 54.21(b). These revisions will identify any changes to the Current Licensing Basis that materially affect the contents of the License Renewal Application, including the USAR supplements.	12 months after LRA submittal date and at least 3 months before completion of NRC review Annual Update was submitted by letter dated 4/13/09	1.4
2	Following the issuance of the renewed operating license, the summary descriptions of aging management programs and TLAAs provided in Appendix A, and the final list of License Renewal commitments, will be incorporated into the PINGP USAR as part of a periodic USAR update in accordance with 10 CFR 50.71(e). Other changes to specific sections of the PINGP USAR necessary to reflect a renewed operating license will also be addressed at that time.	First USAR update in accordance with 10 CFR 50.71(e) following issuance of renewed operating licenses	A1.0
3	An Aboveground Steel Tanks Program will be implemented. Program features will be as described in LRA Section B2.1.2.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.2
4	Procedures for the conduct of inspections in the External	U1 - 8/9/2013	B2.1.6

Prairie Island Nuclear Generating Plant License Renewal Commitments

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	Surfaces Monitoring Program, Structures Monitoring Program, Buried Piping and Tanks Inspection Program, and the RG 1.127 Inspection of Water-Control Structures Associated with Nuclear Power Plants Program will be enhanced to include guidance for visual inspections of installed bolting.	U2 - 10/29/2014	
5	A Buried Piping and Tanks Inspection Program will be implemented. Program features will be as described in LRA Section B2.1.8.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.8
6	The Closed-Cycle Cooling Water System Program will be enhanced to include periodic inspection of accessible surfaces of components serviced by closed-cycle cooling water when the systems or components are opened during scheduled maintenance or surveillance activities. Inspections are performed to identify the presence of aging effects and to confirm the effectiveness of the chemistry controls. Visual inspection of component internals will be used to detect loss of material and heat transfer degradation. Enhanced visual or volumetric examination techniques will be used to detect cracking. [Revised in letter dated 1/20/2009 in response to RAI 3.3.2-13-01]	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.9
7	The Compressed Air Monitoring Program will be enhanced as follows: • Station and Instrument Air System air quality will be monitored and maintained in accordance with the instrument air quality guidance provided in ISA S7.0.01-1996. Particulate testing will be revised	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.10

Prairie Island Nuclear Generating Plant License Renewal Commitments

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	to use a particle size methodology as specified in ISA S7.0.01. • The program will incorporate on-line dew point monitoring. [Revised in letter dated 2/6/2009 in response to Region III License Renewal Inspection]		
8	An Electrical Cable Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program will be completed. Program features will be as described in LRA Section B2.1.11.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.11
9	An Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program will be implemented. Program features will be as described in LRA Section B2.1.12.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.12
10	An Electrical Cables and Connections Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Used in Instrumentation Circuits Program will be implemented. Program features will be as described in LRA Section B2.1.13.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.13
11	The External Surfaces Monitoring Program will be enhanced as follows: • The scope of the program will be expanded as necessary to include all metallic and non-metallic components within the scope of License Renewal that require aging management in accordance with this program.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.14

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	• The program will ensure that surfaces that are inaccessible or not readily visible during plant operations will be inspected during refueling outages. • The program will ensure that surfaces that are inaccessible or not readily visible during both plant operations and refueling outages will be inspected at intervals that provide reasonable assurance that aging effects are managed such that the applicable components will perform their intended function during the period of extended operation. • The program will apply physical manipulation techniques, in addition to visual inspection, to detect aging effects in elastomers and plastics. • The program will include acceptance criteria (e.g., threshold values for identified aging effects) to ensure that the need for corrective actions will be identified before a loss of intended functions. • The program will ensure that program documentation such as walkdown records, inspection results, and other records of monitoring and trending activities are auditable and retrievable. [Revised in letter dated 2/6/2009 in response to RAI B2.1.14-1 Follow Up question]		
12	The Fire Protection Program will be enhanced to require periodic visual inspection of the fire barrier walls, ceilings, and	U1 - 8/9/2013	B2.1.15

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	floors to be performed during walkdowns at least once every refueling cycle. [Revised in letter dated 12/5/2008 in response to RAI B2.1.15-3]	U2 - 10/29/2014	
13	The Fire Water System Program will be enhanced as follows: • The program will be expanded to include eight additional yard fire hydrants in the scope of the annual visual inspection and flushing activities. • The program will require that sprinkler heads that have been in place for 50 years will be replaced or a representative sample of sprinkler heads will be tested using the guidance of NFPA 25, "Inspection, Testing and Maintenance of Water-Based Fire Protection Systems" (2002 Edition, Section 5.3.1.1.1). Sample testing, if performed, will continue at a 10-year interval following the initial testing.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.16
14	The Flux Thimble Tube Inspection Program will be enhanced as follows: • The program will require that the interval between inspections be established such that no flux thimble tube is predicted to incur wear that exceeds the established acceptance criteria before the next inspection. • The program will require that re-baselining of the examination frequency be justified using plant-specific wear rate data unless prior plant-specific NRC	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.18

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	acceptance for the re-baselining was received. If design changes are made to use more wear-resistant thimble tube materials, sufficient inspections will be conducted at an adequate inspection frequency for the new materials. • The program will require that flux thimble tubes that cannot be inspected must be removed from service.		
15	The Fuel Oil Chemistry Program will be enhanced as follows: • Particulate contamination testing of fuel oil in the eleven fuel oil storage tanks in scope of License Renewal will be performed, in accordance with ASTM D 6217, on an annual basis. • One-time ultrasonic thickness measurements will be performed at selected tank bottom and piping locations prior to the period of extended operation.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.19
16	A Fuse Holders Program will be implemented. Program features will be as described in LRA Section B2.1.20.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.20
17	An Inaccessible Medium Voltage Cables Not Subject to 10 CFR 50.49 Environmental Qualification Requirements Program will be implemented. Program features will be as described in LRA Section B2.1.21	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.21
18	An Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components Program will be implemented. Program features will be as described in LRA section B2.1.22. Inspections for stress corrosion cracking will be performed by visual examination with a magnified resolution as described in	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.22

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	10 CFR 50.55a(b)(2)(xxi)(A) or with ultrasonic methods. [Revised in letter dated 2/6/2009 in response to RAI B2.1.22-1 Follow Up question]		
19	The Inspection of Overhead Heavy Load and Light Load (Related to Refueling) Handling Systems Program will be enhanced as follows: • Program implementing procedures will be revised to ensure the components and structures subject to inspection are clearly identified. • Program inspection procedures will be enhanced to include the parameters corrosion and wear where omitted.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.23
20	A Metal-Enclosed Bus Program will be implemented. Program features will be as described in LRA Section B2.1.26.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.26
21	Number Not Used [Revised in letter dated 3/27/2009]		
22	Number Not Used [Revised in letter dated 4/13/2009]		
23	A One-Time Inspection Program will be completed. Program features will be as described in LRA Section B2.1.29.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.29
24	A One-Time Inspection of ASME Code Class 1 Small-Bore	U1 - 8/9/2013	B2.1.30

Prairie Island Nuclear Generating Plant License Renewal Commitments

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	Piping Program will be completed. Program features will be as described in LRA Section B2.1.30.	U2 - 10/29/2014	
25	A. A PWR Vessel Internals Program will be implemented. Program features will be as described in LRA Section B2.1.32. B. An inspection plan for reactor internals will be submitted for NRC review and approval at least twenty-four months prior to the period of extended operation. In addition, the submittal will include any necessary revisions to the PINGP PWR Vessel Internals Program, as well as any related changes to the PINGP scoping, screening and aging management review results for reactor internals, to conform to the NRC-approved Inspection and Evaluation Guidelines. [Revised in letter dated 5/12/2009] [Revised in letter dated 6/24/09 in response to Follow-up RAI B2.1.38]	A. U1 - 8/9/2013 U2 - 10/29/2014 B. U1 - 8/9/2011 U2 - 10/29/2012	B2.1.32
26	The Reactor Head Closure Studs Program will be enhanced to incorporate controls that ensure that any future procurement of reactor head closure studs will be in accordance with the material and inspection guidance provided in NRC Regulatory Guide 1.65.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.33

Prairie Island Nuclear Generating Plant License Renewal Commitments

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
27	The Reactor Vessel Surveillance Program will be enhanced as follows: • A requirement will be added to ensure that all withdrawn and tested surveillance capsules, not discarded as of August 31, 2000, are placed in storage for possible future reconstitution and use. • A requirement will be added to ensure that in the event spare capsules are withdrawn, the untested capsules are placed in storage and maintained for future insertion.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.34
28	The RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants Program will be enhanced as follows: • The program will include inspections of concrete and steel components that are below the water line at the Screenhouse and Intake Canal. The scope will also require inspections of the Approach Canal, Intake Canal, Emergency Cooling Water Intake, and Screenhouse immediately following extreme environmental conditions or natural phenomena including an earthquake, flood, tornado, severe thunderstorm, or high winds. • The program parameters to be inspected will include an inspection of water-control concrete components that are below the water line for cavitation and erosion degradation. • The program will visually inspect for damage such as cracking, settlement, movement, broken bolted and	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.35

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	welded connections, buckling, and other degraded conditions following extreme environmental conditions or natural phenomena.		
29	A Selective Leaching of Materials Program will be completed. Program features will be as described in LRA B2.1.36.	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.36
30	The Structures Monitoring Program will be enhanced as follows: • The following structures, components, and component supports will be added to the scope of the inspections: o Approach Canal o Fuel Oil Transfer House o Old Administration Building and Administration Building Addition o Component supports for cable tray, conduit, cable, tubing tray, tubing, non-ASME vessels, exchangers, pumps, valves, piping, mirror insulation, non-ASME valves, cabinets, panels, racks, equipment enclosures, junction boxes, bus ducts, breakers, transformers, instruments, diesel equipment, housings for HVAC fans, louvers, and dampers, HVAC ducts, vibration isolation elements for diesel equipment, and miscellaneous electrical and mechanical equipment items o Miscellaneous electrical equipment and instrumentation enclosures including cable tray, conduit, wireway, tube tray, cabinets, panels,	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.38

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	racks, equipment enclosures, junction boxes, breaker housings, transformer housings, lighting fixtures, and metal bus enclosure assemblies o Miscellaneous mechanical equipment enclosures including housings for HVAC fans, louvers, and dampers o SBO Yard Structures and components including SBO cable vault and bus duct enclosures. o Fire Protection System hydrant houses o Caulking, sealant and elastomer materials o Non-safety related masonry walls that support equipment relied upon to perform a function that demonstrates compliance with a regulated event(s). • The program will be enhanced to include additional inspection parameters. • The program will require an inspection frequency of once every five (5) years for structures and structural components within the scope of the program. The frequency of inspections can be adjusted, if necessary, to allow for early detection and timely correction of negative trends. • The program will require periodic sampling of groundwater and river water chemistries to ensure they remain non-aggressive.		
31	A Thermal Aging Embrittlement of Cast Austenitic Stainless	U1 - 8/9/2013	B2.1.39

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	Steel (CASS) Program will be implemented. Program features will be as described in LRA Section B2.1.39.	U2 - 10/29/2014	
32	The Water Chemistry Program will be enhanced as follows: • The program will require increased sampling to be performed as needed to confirm the effectiveness of corrective actions taken to address an abnormal chemistry condition. • The program will require Reactor Coolant System dissolved oxygen Action Level limits to be consistent with the limits established in the EPRI PWR Primary Water Chemistry Guidelines." [Revised in letter dated 12/5/2008 in response to RAI B2.1.40-3]	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.40
33	The Metal Fatigue of Reactor Coolant Pressure Boundary Program will be enhanced as follows: • The program will monitor the six component locations identified in NUREG/CR-6260 for older vintage Westinghouse plants, either by tracking the cumulative number of imposed stress cycles using cycle counting, or by tracking the cumulative fatigue usage, including the effects of coolant environment. The following locations will be monitored: ○ Reactor Vessel Inlet and Outlet Nozzles ○ Reactor Pressure Vessel Shell to Lower Head ○ RCS Hot Leg Surge Line Nozzle	U1 - 8/9/2013 U2 - 10/29/2014	B3.2

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	○ RCS Cold Leg Charging Nozzle ○ RCS Cold Leg Safety Injection Accumulator Nozzle ○ RHR-to-Accumulator Piping Tee • Program acceptance criteria will be clarified to require corrective action to be taken before a cumulative fatigue usage factor exceeds 1.0 or a design basis transient cycle limit is exceeded. [Revised in letter dated 1/9/2009 in response to RAI 4.3.1.1-1]		
34	Reactor internals baffle bolt fatigue transient limits of 1835 cycles of plant loading at 5% per minute and 1835 cycles of plant unloading at 5% per minute will be incorporated into the Metal Fatigue of Reactor Coolant Pressure Boundary Program and USAR Table 4.1-8.	U1 - 8/9/2013 U2 - 10/29/2014	B3.2
35	NSPM will perform an ASME Section III fatigue evaluation of the lower head of the pressurizer to account for effects of insurge/outsurge transients. The evaluation will determine the cumulative fatigue usage of limiting pressurizer component(s) through the period of extended operation. The analyses will account for periods of both "Water Solid" and "Standard Steam Bubble" operating strategies. Analysis results will be incorporated, as applicable, into the Metal Fatigue of Reactor Coolant Pressure Boundary Program. [Revised in letter dated 1/9/2009 in response to RAI 4.3.1.1-1]	U1 - 8/9/2013 U2 - 10/29/2014	4.3.1.3
36	NSPM will complete fatigue calculations for the pressurizer surge line hot leg nozzle and the charging nozzle using the	April 30, 2009 Commitment	4.3.3

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	methodology of the ASME Code (Subsection NB) and will report the revised CUFs and CUFs adjusted for environmental effects at these locations as an amendment to the PINGP LRA. Conforming changes to LRA Section 4.3.3, "PINGP EAF Results," will also be included in that amendment to reflect analysis results and remove references to stress-based fatigue monitoring. [Added in letter dated 1/9/2009 in response to RAI 4.3.1.1-1]	closed by letter dated 4/28/09	
37	NSPM will revise procedures for excavation and trenching controls and archaeological, cultural and historic resource protection to identify sensitive areas and provide guidance for ground-disturbing activities. The procedures will be revised to include drawings and illustrations to assist users in identifying culturally sensitive areas, and pictures of artifacts that are prevalent in the area of the Plant site. The revised procedures will also require training of the Site Environmental Coordinator and other personnel responsible for proper execution of excavation or other ground-disturbing activities. [Added in ER revision submitted in letter dated 3/4/2009]	8/9/2013	ER 4.16.1
38	NSPM will conduct a Phase I Reconnaissance Field Survey of the disturbed areas within the Plant's boundaries. In addition, NSPM will conduct Phase I field surveys of areas of known archaeological sites to precisely determine their boundaries. NSPM will use the results of these surveys to designate areas for archaeological protection. [Added in ER revision submitted in letter dated 3/4/2009]	8/9/2013	ER 4.16.2

Prairie Island Nuclear Generating Plant License Renewal Commitments

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
39	NSPM will prepare, maintain and implement a Cultural Resources Management Plan (CRMP) to protect significant historical, archaeological, and cultural resources that may currently exist on the Plant site. In connection with the preparation of the CRMP, NSPM will conduct botanical surveys to identify culturally and medicinally important species on the Plant site, and incorporate provisions to protect such plants into the CRMP. [Added in ER revision submitted in letter dated 3/4/2009]	8/9/2013	ER 4.16.2
40	NSPM will consult with a qualified archaeologist prior to conducting any ground-disturbing activity in any area designated as undisturbed and in any disturbed area that is described as potentially containing archaeological resources (as determined by the Phase I Reconnaissance Field Survey discussed in Commitment Number 38). [Added in ER revision submitted in letter dated 3/4/2009]	8/9/2013	ER 4.16.2
41	During the first refueling outage following refueling cavity leak repairs in each Unit (scheduled for refueling outages 1R26 and 2R26), concrete will be removed from the sump C pit to expose an area of the containment vessel bottom head. Visual examination and ultrasonic thickness measurement will be performed on the portions of the containment vessels exposed by the excavations. An assessment of the condition of exposed concrete and rebar will also be performed. Petrographic examination will be performed on sample pieces of the removed concrete if the	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.38

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	removal method provides pieces suitable for examination. Degradation observed in the exposed containment vessel, concrete or rebar, or as a result of petrographic examination of concrete samples, will be entered into the Corrective Action Program, and evaluated for impact on structural integrity and identification of additional actions that may be warranted. [Added in letter dated 4/6/09 in response to Follow Up RAI B2.1.38] [Revised in letter dated 8/7/09 in response to a follow-up question from a conference call on July 22, 2009]		
42	During the two consecutive refueling outages following refueling cavity leak repairs in each Unit (scheduled for refueling outages 1R26 and 2R26), visual inspections will be performed of the areas where reactor cavity leakage had been observed previously to confirm that leakage has been resolved. The inspection results will be documented. If refueling cavity leakage is again identified, the issue will be entered into the Corrective Action Program and evaluated for identification of additional actions to mitigate leakage and monitor the condition of the containment vessel and internal structures. [Added in letter dated 4/6/09 in response to Follow Up RAI B2.1.38]	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.38
43	Preventive maintenance requirements will be implemented to require periodic replacement of rubber flexible hoses in the Diesel Generators and Support System and in the 122 Diesel Driven Fire Pump that are exposed to fuel oil or lubricating oil internal environments.	U1 - 8/9/2013 U2 - 10/29/2014	Table 3.3.2-8

Prairie Island Nuclear Generating Plant License Renewal Commitments

Commitment Number	Commitment	Implementation Schedule	Related LRA Section Number
	[Added in letter dated 4/6/09 in response to RAI 3.3.2-8-1] [Revised in letter dated 6/5/09]		
44	During the first refueling outage following refueling cavity leak repairs in each Unit (scheduled for refueling outages 1R26 and 2R26), a concrete sample will be obtained from a location known to have been wetted by borated water leakage from the refueling cavity. These concrete samples (one per Unit) will be tested for compression strength and will be subjected to petrographic examination to assess the degradation, if any, resulting from borated water exposure. Degradation identified as a result of the testing and examination of the concrete samples will be entered into the Corrective Action Program, and evaluated for impact on structural integrity and identification of additional actions that may be warranted. [Added in letter dated 8/7/09 in response to a follow-up question from a conference call on July 22, 2009.]	U1 - 8/9/2013 U2 - 10/29/2014	B2.1.38
45	If the original PINGP Unit 2 steam generators are not replaced prior to entry into the period of extended operation, NSPM will perform an inspection of each PINGP Unit 2 steam generator, prior to the period of extended operation, to assess the condition of the divider plates and associated welds. The examination technique(s) will be capable of detecting PWSCC in the divider plates and associated welds. [Added in letter dated 11/5/10]	U2 - 10/29/2014	None