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U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
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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

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

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 Northern States Power Company, a Minnesota Corporation, to the Nuclear Regulatory Commission, "Annual Update of the Application for Renewed Operating Licenses," L-PI-09-043, dated April 13, 2009, ADAMS Accession Number ML091110324.

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. 10 CFR 54.21(b) requires that each year following submittal of a license renewal application, and at least three months before scheduled completion of the NRC review, an amendment to the application shall be submitted that identifies any changes to the current licensing basis (CLB) that materially affect the contents of the LRA. This letter provides that annual update.

* 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.

A review of the PINGP CLB changes since the last LRA annual update, submitted by letter dated April 13, 2009 (Reference 2), has been completed. No CLB changes that materially affect the content of the LRA were identified. Therefore, there is no LRA revision associated with this annual update.

This letter amends the LRA to provide supplemental information regarding the Buried Piping and Tanks Inspection Program, and One-Time Inspection of American Society of Mechanical Engineers (ASME) Code Class 1 Small-Bore Piping Program.

The supplemental information on the Buried Piping and Tanks Inspection Program is in response to industry operating experience (OE) with buried piping systems and the Nuclear Energy Institute (NEI) initiative to address buried piping integrity. The information on the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program is based on recent NRC review of industry socket weld examination issues.

Enclosure 1 provides a description of changes to the PINGP Buried Piping and Tanks Inspection Program and the One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program. Enclosure 1 also includes revisions to the LRA that reflect changes resulting from the supplemental information provided herein.

If there are any questions or if additional information is needed, please contact Mr. Eugene Eckholt, License Renewal Project Manager, at 651-388-1121, ext. 4137.

Summary of Commitments

This letter contains no new commitments and no revisions to existing PINGP License Renewal Commitments as previously submitted; however, Enclosure 1 describes changes to Aging Management Programs that are being implemented in response to PINGP License Renewal Commitments, numbers 5 and 24, as previously submitted in NSPM letter dated August 7, 2009 (ADAMS Accession number ML092360408).

I declare under penalty of perjury that the foregoing is true and correct.
Executed on August 12, 2010.

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

Enclosure

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 BURIED PIPING AND TANKS INSPECTION PROGRAM AND 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) Buried Piping and Tanks Inspection Program and the One-Time Inspection of American Society of Mechanical Engineers (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.

1.0 Aging Management Program (AMP) B2.1.8, Buried Piping and Tanks Inspection Program

Background

In response to industry operating experience with buried piping systems, the Nuclear Energy Institute (NEI) promulgated a formal initiative to address buried piping integrity. This initiative was approved by the Nuclear Strategic Issues Advisory Committee (NSIAC) on November 18, 2009. NSPM is committed to NEI to implementing the industry Buried Piping Integrity Initiative. The scope of the industry program includes all buried piping at PINGP, a subset of which is the buried piping subject to aging management for license renewal.

The Buried Piping Integrity Initiative includes the following key program elements:

- Establish a program document and implementing procedures
- Perform risk ranking of all buried piping
- Develop an inspection plan including the following attributes:
    - Identification of piping segments to be inspected
    - Inspection techniques
    - Inspection schedule for buried piping segments based on risk ranking

The NEI initiative milestones are to complete the risk ranking by December 31, 2010; complete the inspection plan by June 30, 2011; and begin inspections under the inspection plan no later than June 30, 2012.

PINGP Operating Experience

The PINGP License Renewal Application (LRA) included a discussion of plant-specific operating experience (OE) related to the Buried Piping and Tanks Inspection Program. Additional OE information associated with the program was provided in response to NRC Requests for Additional Information (RAI) B2.1.8-1 and RAI B2.1.8-2 in NSPM letter L-PI-08-113 dated December 18, 2008 (ADAMS Accession Number ML083590337). The NSPM response to RAI B2.1.8-2 concluded, in part, that the below grade environment at PINGP is non-aggressive and that no cases of leakage of buried piping at PINGP have occurred due to outside surface corrosion. NSPM offers the following additional OE.

PINGP maintains a cathodic protection system which serves to protect buried steel structures such as fuel oil storage tanks, circulating water lines, fire hydrant lines, and cooling water piping. The impressed-current type cathodic protection system, which was installed in 1973, was designed in accordance with generally accepted practices for protecting buried structures. A rectifier with negative potential is connected to the protected structure and maintains the anodes and the surrounding environment at a positive potential with respect to the structure. The rectifier output voltages and currents are checked on a monthly basis to verify proper operation of the cathodic protection system. 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.

In October 2009, NSPM conducted inspections of buried Fire Protection (FP) System piping at PINGP. The inspections were the first to be credited under the new Buried Piping and Tanks Inspection Program. Portions of six-inch and ten-inch cast iron FP pipes, totaling approximately 27 feet in length, were excavated for inspection. External visual inspection of the coated pipe revealed minor indications such as holidays (discontinuities) and surface corrosion observed through the coating. No leakage was observed. The damaged/degraded coatings were subsequently removed to allow inspection of the underlying pipe for evidence of loss of material. Ultrasonic examination of the pipe concluded that pipe wall thickness remained above nominal. The affected piping was recoated and buried in accordance with established procedures. The backfill around the piping consisted of sand and small rocks, per established engineering specifications.

Impact of Industry OE on PINGP Aging Management Programs

Underground Components

At PINGP, there are underground metallic piping, fittings, and tanks within the scope of license renewal. These components, located below grade in a vault,

are exposed to an air environment and are subject to loss of material due to corrosion. These components are periodically accessed and managed for the effects of aging by the External Surfaces Monitoring Program. This program is implemented as discussed in the PINGP LRA, Appendix B, Section B2.1.14. The External Surfaces Monitoring Program, as described in previous submittals, is capable of identifying age-related degradation of underground components, and provides reasonable assurance that such components will continue to perform their intended function during the period of extended operation. No further revision to this AMP is necessary.

Buried Components

In the PINGP LRA, NSPM proposed to implement a new Buried Piping and Tanks Inspection Program consistent with the aging management program described in NUREG-1801, Revision 1, Chapter XI, Program XI.M34. The program, as submitted, relied on preventive measures, such as coating and wrapping, and periodic visual inspection for loss of material caused by corrosion of the external surface of buried carbon steel and cast iron components. Periodic inspections were to be conducted when the components were excavated for maintenance or other scheduled work. The program would conduct at least one opportunistic or focused inspection within the ten-year period prior to the period of extended operation. Thereafter, at least one opportunistic or focused inspection would be performed every ten years. Based upon recent industry operating experience and adoption of the NEI Buried Piping Integrity Initiative, NSPM proposes to modify the Buried Piping and Tanks Inspection Program as described below.

The modified PINGP Buried Piping and Tanks Inspection Program will include a quantitative risk assessment of all buried piping within the scope of the program. An overall risk factor, which is the product of the susceptibility factor and the consequence factor, will be computed for each zone of buried pipe. The susceptibility factor is based upon such attributes as coating condition, cathodic protection system assessments, and physical layout of the buried pipe. The consequence factor evaluates the consequence of a fluid leak, and is based upon the pipe contents, and the potential impact to plant operation and plant safety. The overall risk factor will be used to determine relative priorities and locations for initial inspections and future (periodic) inspections.

Prior to the period of extended operation, the program will conduct a direct inspection of at least ten feet of excavated piping in each in-scope system. This will include buried piping in the Cooling Water (CL) System, Fire Protection (FP) System, Fuel Oil (FO) System, and Station and Instrument Air (SA) System. Coatings and wrappings will be visually inspected following excavation. If any evidence of damage to the coating or wrapping, such as coating perforation, holidays, or other damage is detected, the protected components will be visually or ultrasonically inspected for evidence of loss of material. If no evidence of

damage to the coating or wrapping is detected, then the coating or wrapping will not be removed for further inspection. 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.

In addition, the program will inspect three buried tanks within the scope of the program in the ten years preceding the period of extended operation. Tank inspections will be focused on detecting loss of material through the use of ultrasonic inspection or other acceptable examination technique. Tank inspections will be comprehensive and will provide assurance of the overall integrity of the entire tank. The UT grid size will be specified in accordance with approved procedures. Ultrasonic inspection of tanks will be conducted by qualified personnel in accordance with approved procedures subject to the requirements of the Quality Assurance Program.

The program will perform periodic inspections of buried piping based upon the results of the risk assessment, as well as the initial inspection results, and industry and plant-specific operating experience. A representative sample of buried piping, including a minimum of four inspection locations, will be inspected every ten-year period of the license renewal term. A minimum of three buried tanks will be inspected periodically on a ten-year interval.

The program credits an installed cathodic protection system as an additional preventive measure. The program will ensure that the cathodic protection system is maintained and annually tested in accordance with NACE International standards (or currently accepted industry guidance). Cathodic protection currents and component-to-soil potentials are measured periodically to ensure proper function of the system and protection of buried components. The program will maintain a minimum system availability of 90% by ensuring that power is available to the rectifiers.

Amendment to LRA

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

LRA Appendix A, Section A2.8, 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 in accordance with NACE International standards. The program performs visual inspections following excavation of external surfaces of buried components (e.g., piping, tanks, 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. 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.

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. 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.

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 in accordance with NACE

International standards. Cathodic protection currents and component-to-soil potentials are measured periodically to ensure a minimum system availability of 90%. The program performs visual inspections following excavation of external surfaces of buried components (e.g., piping, tanks, 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. 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.

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. 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 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 in accordance with NACE International standards. 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.

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

Based upon recent NRC review and evaluation of industry socket weld examination issues for license renewal, NSPM provides the following update to the PINGP One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program.

The PINGP One-Time Inspection of ASME Code Class 1 Small-Bore Piping Program is being supplemented, as described herein, to include the requirement to perform one-time volumetric examinations of six ASME Class 1 socket welds, three per Unit, prior to the period of extended operation. Volumetric examinations will be conducted using a qualified inspection methodology that can accurately detect discontinuities within the specified examination volume, if the methodology is available. Sample selection will be based on inspectability, dose considerations, operating experience, and risk significance of locations determined to be susceptible to cracking using 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, one destructive examination will be performed in lieu of the six volumetric examinations.

Amendment to LRA

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

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. 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, one socket weld 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 piping (including pipes, fittings, and branch connections) less than 4-inch nominal pipe size. 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 six ASME Class 1 socket welds, three per Unit. Volumetric examinations are conducted using a qualified inspection methodology that can accurately detect discontinuities within the specified examination volume, if available. One destructive examination will be performed in lieu of the six 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.