

August 7, 2000

Mr. Michael D. Wadley, President  
NSP Nuclear Generation  
Northern States Power Company  
414 Nicollet Mall  
Minneapolis, MN 55401

SUBJECT: PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 1 - EVALUATION OF  
RELIEF REQUEST NO. 8 FOR THE THIRD 10-YEAR INTERVAL INSERVICE  
INSPECTION PROGRAM PLAN (TAC NO. MA6335)

Dear Mr. Wadley:

By letter dated August 19, 1999, Northern States Power Company (NSP) submitted Relief Request No. 8, related to the third 10-year interval inservice inspection program plan, entitled "Limited Examination." The staff has reviewed NSP's submittal and finds the request for relief acceptable. NSP has demonstrated that the required examinations are impractical. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), the staff grants approval of Relief Request No. 8. The relief granted is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest, giving due consideration to the burden on NSP if the requirements were imposed on the facility.

The detailed results of the staff's review are provided in the enclosed safety evaluation. If you have any questions concerning this action, please call Mr. T. Kim of my staff at (301) 415-1392.

Sincerely,

*/RA/*

Claudia M. Craig, Chief, Section 1  
Project Directorate III  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-282

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

OF THE THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PLAN

RELIEF REQUEST NO. 8

NORTHERN STATES POWER COMPANY

PRAIRIE ISLAND NUCLEAR GENERATING PLANT, UNIT 1

DOCKET NO. 50-282

1.0 INTRODUCTION

Inservice inspection (ISI) of the American Society of Mechanical Engineers Code (ASME Code), Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel (B&PV) Code (the Code) and applicable addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 50.55a(6)(g)(i).

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code, which were incorporated by reference in 10 CFR 50.55a(b) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The Code of record for Prairie Island Nuclear Generating Plant, Unit 1, is the 1989 edition.

2.0 EVALUATION

By letter dated August 19, 1999, Northern States Power Company (NSP or the licensee) submitted Relief Request No. 8, related to the third 10-year interval ISI program plan, entitled "Limited Examination," for Prairie Island, Unit 1. The information provided by the licensee in support of its alternative to the Code requirements has been evaluated and the basis for the staff's disposition is documented below. The components for which relief is requested are listed in the attachment to this safety evaluation.

ENCLOSURE

Applicable ASME Code Section XI (1989 edition) requirement from which relief is requested:

ASME Code Section XI (1989 edition no addenda) requires full examination of ISI components per Tables IWB-2500-1 and IWC-2500-1. Regulatory Guide 1.147 endorses Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds." Code Case N-460 allows greater than 90-percent coverage of a weld to meet the "essentially 100 percent" requirement.

NRC Information Notice 98-42, "Implementation of 10 CFR 50.55a(g) Inservice Inspection Requirements," dated December 1, 1998, clarified the definition of "essentially 100 percent" to mean greater than 90 percent.

The Prairie Island construction permit was issued in 1967. This facility was designed and constructed with limited accessibility due to component configurations and/or physical barriers for which 100-percent coverage is not achievable on some ISI components.

Licensee's Basis for Relief:

Prairie Island was designed and constructed prior to development of ASME Code Section XI, therefore, design for accessibility and inspection coverage is not in many cases, sufficient to permit satisfying the current Code requirements. Limitations to inspections are primarily due to obstructions and interference.

Summary of the limited examinations are described below:

Part A: Category B-J, "Pressure Retaining Welds in Piping"

For a 12" accumulator discharge, the ultrasonic test (UT) coverage for valve-to-elbow weld W-1 is 75 percent. Additional volumetric coverage can not be obtained due to valve configuration which prevents examination from the upstream side of the valve.

For PLO-Cap "B", the UT coverage for nozzle-to-pipe weld W-2 is 78.55 percent, additional volumetric coverage can not be obtained due to nozzle configuration contour.

For reactor coolant loop "A", the UT coverage for reducer-40°-elbow-to-nozzle weld W-5 is 48.0 percent, additional volumetric coverage can not be obtained due to joint configuration limits access on the downstream side of the weld.

For reactor coolant loop "B", the UT coverage for nozzle-to-40°-elbow W-1 is 60.0 percent, additional volumetric coverage can not be obtained due to nozzle configuration.

For safety injection system (SIS) high head "A", the UT coverage for elbow-to-nozzle weld W-10 is 84.1 percent, additional volumetric coverage can not be obtained due to nozzle configuration.

For SIS high head "A", the UT coverage for nozzle-to-pipe weld W-11 is 74.5 percent, additional volumetric coverage can not be obtained downstream due to joint configuration.

Part B: Category F-A, "Supports" & Category C-C, "Integral attachments for Vessels, Piping, Pumps and Valves"

For main steam "A", the surface examination coverage for the bearing brake assembly restraint H-7 is limited to 84.6 percent, additional coverage can not be obtained because examination is restricted at six locations due to tack welded cover plate.

For main steam "B", the surface examination coverage for the seismic restraint H-2 is limited to 70.54 percent, additional coverage can not be obtained due to restraint configuration.

For main steam "B", the surface examination coverage for the seismic restraint H-1 is limited to 85.11 percent, additional coverage can not be obtained due to restraint configuration.

For main steam "B", the surface examination coverage for the seismic restraint H-3 is limited to 85.11 percent, additional coverage can not be obtained due to restraint configuration.

For safety injection pump 12, the surface examination coverage for support A is limited to 84.00 percent due to configuration of the support.

For safety injection pump 12, the surface examination coverage for support B is limited to 84.00 percent due to configuration of the support.

For safety injection pump 12, the surface examination coverage for support C is limited to 84.00 percent due to configuration of the support.

For safety injection pump 12, the surface examination coverage for support D is limited to 84.00 percent due to configuration of the support.

Licensee's Proposed Alternative:

The limitations have been noted on the ISI examination reports and are included in the ISI Outage Summary Report. NSP will continue to document the limitations.

All ISIs at Prairie Island, Unit 1, have been done to the greatest extent practical. When limitation to required inspections are encountered, M&SP procedure ISI-LTS-1 is applied which requires alternative examination techniques be considered, or applied to gain the maximum obtainable inspection coverage practical. In all of the above items identified this procedure was used and the maximum inspection coverage was achieved.

Limitations are due to design, geometry, and materials of construction of the components or as low as reasonably achievable concerns. NSP will continue to utilize the most current techniques available for future examinations.

Additional Means of Establishing Integrity:

In addition, system pressure tests are performed during regular inspection intervals to ensure the piping system is capable of maintaining pressure integrity. System integrity is monitored continuously during normal operation by many direct and indirect methods (e.g., containment radiation monitoring, containment air monitoring, containment sump monitoring, containment temperature monitoring, system walk downs, etc.).

Staff's Disposition:

The 1989 edition of ASME Code Section XI, Table IWB-2500-1, Examination category B-J, Item Nos. B9.11 and B9.31, require a 100-percent surface and volumetric examination of circumferential and branch pipe connection welds NPS 4 or larger in Class 1 pressure-retaining piping. However, as shown in sketches provided by the licensee in its August 19, 1999, letter, the extent of volumetric examinations of welds for Item Nos. B9.11 and B9.31 is limited by interference from joint configurations and nozzle geometries. Therefore, the Code volumetric coverage requirements are impractical for these welds. To complete the examinations to the extent required by the Code, the licensee would have to redesign and modify the subject piping and/or nozzles. Imposition of the Code coverage requirements would result in a considerable burden on the licensee.

The licensee has performed examinations on the welds for Item Nos. B9.11 and B9.31 ranging from 48.0 percent to 84.1 percent of the Code-required volumetric examinations and 100 percent of the surface examinations. Based upon the portion of the welds examined volumetrically, and the 100 percent surface examinations coverage, it is concluded that significant patterns of degradation would have been detected and reasonable assurance of the structural integrity of these circumferential welds is provided.

The staff determined that the licensee has volumetrically examined the subject welds (Item Nos. B9.11 and B9.31) to the extent practical. The licensee has examined a significant portion of the subject welds in addition to completing the surface examination. The above examinations provide reasonable assurance of structural integrity of the subject welds. The licensee has demonstrated that the Code-required volumetric and surface examinations are impractical. Based on the above, the staff has concluded that granting this relief will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

For Part B of the relief request, the 1989 Code requires a 100-percent surface examination of the subject items - Category F-A, "Supports," and Category C-C, "Integral attachments for Vessels, Piping, Pumps and Valves." Review of sketches submitted by the licensee revealed that complete examination coverage was impractical due to restricted access caused by interference from permanent restraints and pump configurations. To meet the Code requirements, the integral attachments and/or interfering structures would require design modification and/or removal to allow access to the subject welds. Therefore, surface examination of the subject integral attachment welds is impractical to perform to the extent required by the Code. Imposition of this requirement would create a considerable burden on the licensee without a compensating increase in safety.

The licensee has completed a significant portion ranging from 70.54 percent to 85.11 percent of the Code-required surface examinations for the subject components. Based upon the surface coverage obtained for each component, the staff concludes that existing patterns of degradation, if present, would have been detected, thus providing reasonable assurance of the structural integrity of the integral attachment welds. The licensee has demonstrated that the Code-required volumetric and surface examinations are impractical. The staff has concluded that granting this relief will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i).

### 3.0 CONCLUSION

The staff concludes that certain inservice examinations are impractical and cannot be performed to the extent required by the Code at Prairie Island, Unit 1. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) for Relief Request No. 8 for the third ISI interval at Prairie Island, Unit 1. The staff concludes that granting this relief is authorized by law and will not endanger life or property or the common defense and security and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Attachment: Components Included in Relief Request No. 8

Principal Contributor: A. Keim

Date: August 7, 2000

## COMPONENTS INCLUDED IN RELIEF REQUEST NO. 8

The components for which relief is requested are listed below. There are two parts to the Relief Request; Part A of the Relief Request is for Category B-J, "Pressure Retaining Welds in Piping," and Part B of the Relief Request is for Category F-A, "Supports," and Category C-C, "Integral Attachments for Vessels, Piping, Pumps and Valves."

Category	Item No.	Item ID.	Description	Coverage	Limitation
B-J	B9.11	W-1	valve-elbow 12"accum. Disch.	75% Volumetric	Valve configuration prohibits examination from upstream side
B-J	B9.11	W-2	nozzle-pipe PLO-CAP B	78.55% Volumetric	Nozzle configuration
B-J	B9.11	W-5	reducer 40° elbow to nozzle reactor coolant loop A	48.00% Volumetric	Joint configuration limits access on downstream side of weld
B-J	B9.11	W-1	nozzle - 40° elbow reactor coolant loop B	60.0% Volumetric	Nozzle configuration limits scan
B-J	B9.11	W-10	elbow to nozzle SIS High Head A	84.1% Volumetric	No scan downstream due to nozzle configuration
B-J	B9.31	W-11	nozzle to pipe SIS High Head A	74.5% Volumetric	No scan downstream due to joint configuration
C-C/F-A	C3.20	H-7	bearing break assembly restraint Main Steam A	84.6% Surface	Examination limited at 6 locations due to tack welded cover plate
C-C/F-A	C3.20	H-2	seismic restraint Main Steam B	70.54% Surface	Examination limited to 364 sq. inches of 515 sq. inches due to weld configuration
C-C/F-A	C3.20	H-1	seismic restraint Main Steam B	85.11% Surface	Exam limited to 183 of 215 sq. inches due to configurations

C-C/F-A	C3.20	H-3	seismic restraint Main Steam B	85.11% Surface	Exam limited to 183 of 215 sq. inches due to configurations
C-C/F-A	C3.20	H-1	Support A SI Pump 12	84.00% Surface	Configuration prohibits examining weld at base of support
C-C/F-A	C3.20	H-2	Support B SI Pump 12	84.00% Surface	Configuration prohibits examining weld at base of support
C-C/F-A	C3.20	H-3	Support C SI Pump 12	84.00% Surface	Configuration prohibits examining weld at base of support
C-C/F-A	C3.20	H-4	Support D SI Pump 12	84.00% Surface	Configuration prohibits examining weld at base of support