



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO ASME CODE CASE N-524

NORTHERN STATES POWER COMPANY

PRAIRIE ISLAND NUCLEAR GENERATING PLANT

DOCKET NOS. 50-282 AND 50-306

1.0 INTRODUCTION

The Technical Specifications for the Prairie Island Nuclear Generating Plant state that the inservice inspection and testing of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulties without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) shall meet the requirements that become effective subsequent to editions specified in 10 CFR 50.55a(g)(2) and (3), 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 incorporated by reference in 10 CFR 50.55a(b) on the date 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein.

The applicable edition of Section XI of the ASME Code for the Prairie Island third 10-year Inservice Inspection (ISI) Interval is the 1989 Edition. The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Commission approval. Pursuant to 10 CFR 50.55a(g)(5)(iii), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is impractical for its facility, information

should be submitted to the Commission in support of that determination. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law; will not endanger life, property, or the common defense and security; and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed.

By letter dated November 17, 1995, Northern States Power Company (the licensee) requested approval for implementation of the alternative rules of ASME Section XI Code Case N-524 dated August 9, 1993, entitled, "Alternative Examination Requirements for Longitudinal Welds in Class 1 and 2 Piping Section XI, Division 1", pursuant to 10 CFR 50.55a(a)(3) to be applied to the Prairie Island Third 10-Year ISI Interval.

Code Case N-524 was approved by ASME on August 9, 1993. However, because it was only recently approved by ASME, the code case has not yet been endorsed in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability-ASME Section XI Division 1." Until the code case is generically endorsed by NRC regulation, specific NRC authorization is required before it can be used.

2.0 EVALUATION

The ASME Section XI Code (1989 Edition) requires one pipe diameter in length, but no more than 12 inches, be examined for Class 1 longitudinal piping welds. Class 2 longitudinal piping welds are required to be examined for a length of $2.5t$, where t is the thickness of the weld. These lengths of weld are measured from the intersection of the circumferential weld and longitudinal weld. The licensee's proposed alternative, Code Case N-524, limits the volumetric and surface examination requirements of the longitudinal weld to the volume or area contained within the examination requirements of the intersecting circumferential weld.

Longitudinal welds are produced during the manufacturing process of the piping, not in the field as is the case for circumferential welds. The Code contains requirements on characteristics and performance of materials and products and specifies the examination requirements during the manufacturing of the subject longitudinal piping welds.

In addition, there are material, chemical, and tensile strength requirements in the Code. The manufacturing process that is specified by the Code provides assurance of the structural integrity of the longitudinal welds at the time the piping is manufactured.

The preservice examination and initial inservice examinations have provided assurance of the structural integrity of the longitudinal welds during the service life of the plant to date. The experience in the United States has been that ASME Code longitudinal welds have not experienced degradation that would warrant continued examination beyond the boundaries required to meet the circumferential weld examination requirements. No significant loading

conditions or known material degradation mechanisms have become evident to date which specifically relate to longitudinal seam welds in nuclear plant piping.

When implementing the alternatives contained in Code Case N-524, both surface and volumetric examinations of longitudinal welds, as applicable, are not required beyond the examination zone of the associated circumferential weld. When the longitudinal weld can be identified, only that portion of the longitudinal weld intersecting the circumferential weld is required to be examined for flaws parallel and transverse to the weld. Where the longitudinal weld cannot be identified, 100% of the circumferential weld shall be examined for flaws parallel and transverse to the weld to ensure that the longitudinal/circumferential weld intersection is examined. Based on the extent of surface and volumetric examinations that will be performed in conjunction with examination of the associated circumferential weld, the staff concludes that Code Case N-524, when implemented in its entirety, interrogates the most critical area associated with the longitudinal weld, providing an acceptable level of quality and safety. It should be noted that when implementing alternatives contained in Code Case N-524, requirements for examination of longitudinal welds contained in Table IWB-2500 are superseded.

The licensee is authorized to use Code Case N-524 for its current interval or until such time as the code case is included in a future revision of Regulatory Guide 1.147. At that time the licensee is to follow all provisions in Code Case N-524, with limitations issued in Regulatory Guide 1.147, if any, if the licensee continues to implement this relief request.

3.0 CONCLUSION

Under provisions of 10 CFR 50.55a(a)(3)(i), the staff has determined that the licensee's proposed alternative to the ASME Section XI Code (1989 Edition) requirements will provide an acceptable level of quality and safety. Accordingly, the licensee's proposed alternative to use Code Case N-524 is authorized to be utilized the Prairie Island Nuclear Generating Plant, Units 1 and 2. The licensee is authorized to use Code Case N-524 for its current interval or until such time as the code case is included in a future revision of Regulatory Guide 1.147. At that time the licensee is to follow all provisions in Code Case N-524, with limitations issued in Regulatory Guide 1.147, if any, if the licensee continues to implement this relief request.

Principal Contributors: T. McLellan
L. Tran

Date: June 21, 1996

Mr. Roger O. Anderson, Director
Northern States Power Company

Prairie Island Nuclear Generating
Plant

cc:

J. E. Silberg, Esquire
Shaw, Pittman, Potts and Trowbridge
2300 N Street, N. W.
Washington DC 20037

Site General Manager
Prairie Island Nuclear Generating
Plant
Northern States Power Company
1717 Wakonade Drive East
Welch, Minnesota 55089

Adonis A. Neblett
Assistant Attorney General
Office of the Attorney General
455 Minnesota Street
Suite 900
St. Paul, Minnesota 55101-2127

U.S. Nuclear Regulatory Commission
Resident Inspector's Office
1719 Wakonade Drive East
Welch, Minnesota 55089-9642

Regional Administrator, Region III
U.S. Nuclear Regulatory Commission
801 Warrenville Road
Lisle, Illinois 60532-4351

Mr. Jeff Cole, Auditor/Treasurer
Goodhue County Courthouse
Box 408
Red Wing, Minnesota 55066-0408

Kris Sanda, Commissioner
Department of Public Service
121 Seventh Place East
Suite 200
St. Paul, Minnesota 55101-2145

Site Licensing
Prairie Island Nuclear Generating
Plant
Northern States Power Company
1717 Wakonade Drive East
Welch, Minnesota 55089

March 1995