



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO THE THIRD TEN-YEAR INTERVAL INSERVICE INSPECTION

RELIEF REQUEST 16 AND 18 ON ASME CODE CASE N-524

WISCONSIN ELECTRIC POWER COMPANY

POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2

DOCKETS NOS. 50-266 AND 50-301

1.0 INTRODUCTION

By letter dated June 27, 1994, Wisconsin Electric Power Company (licensee) requested approval for the 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 third Inservice Inspection (ISI) program for Point Beach Nuclear Plant, Units 1 and 2.

The Technical Specifications for Point Beach Nuclear Plant, Units 1 and 2, 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). Section 50.55a(a)(3) of 10 CFR 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, 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 ten-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code. This is 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 Point Beach Nuclear Plant, Units 1 and 2, third inservice inspection (ISI) interval is the 1986 Edition, no addenda. 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), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. 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.

## 2.0 EVALUATION

### CODE CASE N-524 ALTERNATIVE EXAMINATION REQUIREMENTS FOR LONGITUDINAL WELDS IN CLASS 1 AND 2 PIPING - SECTION XI, DIVISION 1

#### Component Identification

Longitudinal Welds in Class 1 and 2 Piping

ASME Section XI Requirements (1986 edition, no addenda)

#### Table IWB-2500-1

Examination Method: Surface and volumetric

Note 4: The examination includes at least a pipe-diameter length but not more than 12-in. of each longitudinal weld intersecting the circumferential welds required to be examined by Examination Categories B-F and B-J.

#### Table IWC-2500-1

Examination Method: Surface and volumetric

Extent of Examination:  $2.5t$  - at the intersecting circumferential weld, where  $t$  is the thickness of the weld.

#### Licensee's Basis for Request

"The ASME Section XI Subcommittee Task Group on ISI Optimization developed a paper that evaluates the examination of longitudinal seam welds in ASME class 1 and 2 piping. This evaluation was the basis for Code Case N-524. The evaluation addressed industry survey results, generic industry experience, operational loading, degradation mechanisms, safety, man-rem exposure and cost. It was concluded that there is little, if any, technical benefit to performing inservice inspections on longitudinal piping welds."

"Based on the results of the Code Case N-524 basis paper, and the radiation exposure associated with longitudinal seam weld examinations, Wisconsin Electric Point Beach Nuclear Plant proposes the alternative examination delineated in Code Case N-524 for longitudinal welds in class 1 and 2 piping."

#### Proposed Alternative Examination

The licensee proposes to apply Code Case N-524 as alternative rules for the examination of longitudinal welds in Class 1 and 2 piping.

#### Evaluation/Conclusions

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 ASME Code contains requirements for characteristics and performance of materials and products, and specifies examination requirements for 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 subsequent 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. If any degradation associated with a longitudinal weld were to occur,

it is expected that it would be located at the intersection with a circumferential weld. This intersection is inspected in accordance with the provisions of Code Case N-524. In addition, there is a significant accumulation of man-rem associated with the examination of longitudinal welds, especially in Class 1 piping. The staff concludes that continued imposition of the Code examination requirements for longitudinal welds constitutes a hardship without a compensating increase in the level of quality and safety. Code Case N-524 is presently under review by the NRC Staff, and should be included in a future revision of Regulatory Guide 1.147 for general use by licensees.

Accordingly the licensee's proposed alternative to use Code Case N-524 is authorized for Point Beach Nuclear Plant, Units 1 and 2, pursuant to 10 CFR 50.55a(a)(3)(ii) until such time as the Code Case is published 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.

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Date: October 5, 1994