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 SCHROCK, C.A. Wisconsin Public Service Corp.
 RECIP. NAME RECIPIENT AFFILIATION
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SUBJECT: Forwards Inservice Insp Plant Relief Request RR 1-9 from volumetric exam of SG nozzle inner radius. Subj exam would require significant R&D. Remote visual exam will be performed using robotic-type camera.

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MAY 1992

**WISCONSIN PUBLIC SERVICE CORPORATION**

600 North Adams • P.O. Box 19002 • Green Bay, WI 54307-9002

September 17, 1992

10 CFR 50.55a(g)(5)(iii)

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Ladies/Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Inservice Inspection Plan Relief Request

- References: (1) Letter from D. C. Hintz (WPSC) to Document Control Desk (NRC) dated March 20, 1987.
- (2) Letter from John N. Hannon (US NRC) to C. R. Steinhardt (WPSC) dated April 25, 1989.

By letter dated March 20, 1987 (reference 1), Wisconsin Public Service Corporation (WPSC) requested relief from certain examination requirements of the 1980 Edition through 1981 Addenda of Section XI of the ASME Boiler and Pressure Vessel Code. Included in this letter was a relief request, RR 1-9, to conduct a visual examination of the inside radius section of the four steam generator primary nozzles in lieu of a volumetric examination. In reference 2, based on improved methods and techniques, the Nuclear Regulatory Commission (NRC) requested WPSC to re-evaluate its determination that the volumetric examination is impractical to perform.

This subject was discussed with NRC staff members Mr. George Johnson and Mr. Allen Hansen on February 18, 1992, when it was mutually agreed that the relief request should be resubmitted to the NRC staff. This decision was based on the availability of additional supporting information. Pursuant to 10 CFR 50.55a(g)(5)(iii), the specific relief request for this item is provided as an attachment to this letter and includes information which supports

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our determination that conformance with the ASME Code, for the examination described, is impractical for our facility. Please feel free to contact a member of my staff if you have any questions regarding this submittal.

Sincerely,

C.A. Schrock

C. A. Schrock
Manager-Nuclear Engineering

RLF/jms

Attach.

cc - Mr. Patrick Castleman, US NRC
US NRC - Region III

LIC\NRC\ISI-RR

ATTACHMENT 1

To

Letter from C. A. Schrock (WPSC)

To

Document Control Desk (NRC)

Dated

September 17, 1992

RELIEF REQUEST NO. RR 1-9

1. Components Affected

Four Class 1 Nozzles:

	<u>Isometric</u>
Steam Generator 1A Hot Leg Nozzle	M-1201
Steam Generator 1A Intermediate Leg Nozzle	M-1201
Steam Generator 1B Hot Leg Nozzle	M-1201
Steam Generator 1B Intermediate Leg Nozzle	M-1201

2. Section XI Requirements

Volumetric Examination of nozzle inner radius per 1980W1981, Table IWB-2500-1, Examination Category B-D, Item B3.140

3. Basis for Requesting Relief

No practical method exists for volumetrically examining the inner radius of the steam generator nozzles at the Kewaunee Nuclear Power Plant (KNPP). A volumetric examination would require significant research and development efforts. Due to the complex geometry (and other reasons discussed herein) the utilization of either a demonstration block or unrestricted access to the inside surface of the nozzle is required for development of an ultrasonic examination procedure. During original plant construction, Wisconsin Public Service Corporation (WPSC) did not design or fabricate a demonstration block. The original plant ISI rules and existing ISI rules for the steam generator nozzle do not mandate the utilization of a demonstration block.

Utilizing the actual steam generator inner radius section to develop an ultrasonic examination procedure requires access to both the inside and outside surface of the nozzle. The design of the steam generator is such that access to the inner radius section requires removing and entering through the primary manways. The radiation levels inside the steam generator primary bowl range from approximately 1 to 5 R/Hr. After access to the inside surface has been obtained, this process would consist of plotting the area of the nozzles to be ultrasonically tested. Procedure development

would require trial and error sound attenuation to ensure proper volumetric examination beam angles, transducer frequency, sound path depth, and scanning paths. Utilizing the existing steam generator nozzle inner radius sections for development of an ultrasonic examination procedure would require extensive man hours (i.e., estimated 16 hours) inside the steam generator, resulting in very high radiation dose.

Even if WPSC had a demonstration block or unrestricted access to the inside radius section, research and development efforts would not result in an ultrasonic examination procedure capable of satisfying the Code required examination coverage for the following reasons:

- 1) The coarse grain found in castings causes sound to be attenuated.
- 2) A perpendicular scan to the inner radius section cannot be maintained.
- 3) It is difficult to differentiate flaws from normal geometry (clad roll).
- 4) Section V of the ASME Code provides no guidance for the design and fabrication of calibration blocks for nozzle inner radius sections.

WPSC has reviewed several vendor "best effort" outer surface volumetric methods, and although improvements have been made in this evolving technology, there are still no methods currently available which satisfy Code requirements for examination volume and sensitivities for cast material. A volumetric examination is impractical for KNPP at this time.

4. Alternative Method of Examination

A remote visual examination of the accessible portions of the inner radius will be performed using a robotic type camera. This Section XI visual examination is adequate for detection of gross cracking that could effect the pressure boundary. These examinations will be performed, concurrent with scheduled steam generator tube eddy current inspections and/or nozzle dam installation or removal. The steam generator tube inspection frequency will be in accordance with Technical Specification 4.2.b.3. Due to the extremely high radiation levels, a camera will not be installed for the exclusive purpose of conducting this visual examination. The visual examinations will only be performed when a camera is already installed in the steam generator bowl for scheduled activities such as steam generator tube eddy current inspection or nozzle dam installation/removal. VT-2 inspections will also be performed during the periodic class 1 system pressure tests. These examinations will ensure integrity of the pressure boundary.

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WPSC is considering replacement of the steam generators at the KNPP. Replacement is expected to be performed during the 3rd Inspection Interval (1994-2004). Since WPSC is required and committed to examining Section XI components, design and material selection for the bowl of the new steam generators is currently being evaluated to ensure a volumetric examination can be adequately performed following replacement. WPSC is considering a forged bowl for the new steam generators. The forged construction will reduce the technical difficulties associated with performing examinations on cast material. A mock-up of the steam generator nozzles might also be procured to permit development and qualification of the UT procedure consistent with the intent of Appendix VIII of Section XI.

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