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Kewaunee Nuclear Power Plant
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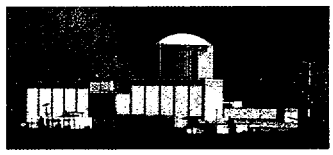
Operated by
Nuclear Management Company, LLC



October 13, 2000

U.S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D.C. 20555-0001

Ladies/Gentlemen:

Docket 50-305
Operating License DPR-43
Kewaunee Nuclear Power Plant
Relief Request Regarding the Application of ASME Code Case N-416-2 to the Kewaunee Inservice Inspection and Repair/Replacement Programs Including the Kewaunee Replacement Steam Generator Project

References: 1) Code Case N-416-2, "Alternative Pressure Test Requirement for Welded Repairs, Fabrication Welds for Replacement Parts and Piping Subassemblies, or Installation of Replacement Items by Welding, Class 1, 2, and 3 Section XI, Division 1," ASME approval date: May 5, 2000.

2) Letter, "Approval of Code Cases N-416-1 and N-498-1 as Alternatives to the Required Hydrostatic Pressure Tests – Kewaunee Nuclear Power Plant (TAC No. M91226)," from Mr. Leif J. Norrholm, Office of Nuclear Reactor Regulation, to Mr. C.A. Shrock, Wisconsin Public Service Corporation, dated February 15, 1995.

KNPP has determined that certain hydrostatic pressure test requirements specified by its ASME Section XI ISI program and Repair/Replacement Program create a hardship or unusual difficulty. Therefore, KNPP is requesting approval pursuant 10CFR50.55a(a)(3) for the use of ASME Code Case N-416-2, Reference 1, as an alternative to the ASME Section XI hydrostatic pressure test requirements in effect at KNPP. Code Case N-416-2 was approved for use on May 5, 2000, by the ASME Board on Nuclear Codes and Standards and is included in Supplement 9 of the Code Case Book for the 1998 Edition of the ASME Code.

As part of this relief request, KNPP is requesting approval to apply Code Case N-416-2 to the upcoming steam generator replacement project. The KNPP steam generator replacement project will install two (2) new steam generator lower assemblies (SGLAs), refurbish and reuse the existing steam domes, and modify the steam generator support structures and connecting piping/instrumentation systems to accommodate the new SGLAs. The replacement steam generators (RSGs) are comprised of Westinghouse model 54F lower units with refurbished steam drums and modified feedring/thermal sleeve assemblies. The Westinghouse model 54F RSGs are designed to be a like-in-kind replacement for the original Westinghouse model 51 steam generators. The RSGs are being designed by Westinghouse and manufactured by Ansaldo Energia in accordance with ASME Section III, 1986 Edition, 1987 Addenda. Westinghouse reconciled the overall design of the RSGs between the ASME Section III, 1986 Edition, 1987 Addenda, and the original steam generator

code of record, ASME Section III Class A, 1965 Edition, Summer 1966 Addenda, Code Case No. 1429. Each SGLA is considered a Section III nuclear part. As such, each SGLA will be stamped with an ASME NPT stamp, by Ansaldo, prior to shipment to the Kewaunee plant.

The RSGs will be installed in the Kewaunee plant by completing the installation welds that will join the new SGLAs to the refurbished steam domes. Also, the primary and secondary piping installation welds will be completed during the installation. Bechtel Power Corporation and its subcontractors will perform the RSG installation. The RSG installation will be performed in accordance with approved Directives and Procedures as required by the Kewaunee Operational Quality Assurance Program and the Kewaunee Repair/Replacement Program, which comply with ASME Section XI, 1989 Edition, no addenda.

In February 1995, the NRC approved KNPP's use of Code Case N-416-1. This approval is documented in Reference 2. Code Case N-416-2 includes all of the requirements specified in N-416-1. In addition, N-416-2 specifically clarifies and outlines the use of a system leakage test and associated NDE as an acceptable alternative to performing the hydrostatic pressure test required by Section XI for Class 1, 2 and 3 items when applied to fabrication welds.

Attached Relief Request RR-G-4, for KNPP's third ISI interval, further discusses Code Case N-416-2 and the request to apply it to KNPP's Section XI Repair/Replacement program, ISI program, and steam generator replacement project. In accordance with 10CFR50.55a(a)(3), the description and basis for the relief request, along with the alternative methods of examination, are included in the attachment to this letter. Based on the information in RR-G-4, KNPP has determined that the alternative pressure test and NDE provisions of the ASME approved Code Case N-416-2 will provide an acceptable level of quality and safety. Compliance with the requirements of ASME Section XI, 1989 Edition, would result in hardship without a compensating increase in the level of quality and safety.

KNPP has delayed requesting relief until receiving the official published Code Case N-416-2. The code case is published in Supplement 9 of the ASME Code Case Book. The receipt of the code case was anticipated to occur in late August 2000 but was not received until the latter part of September 2000. The attached relief request significantly impacts the engineering and planning activities associated with the KNPP steam generator replacement project. The steam generator replacement outage will begin in September 2001. Due to delays in the replacement steam generator fabrication schedule, the steam generator replacement engineering and planning activities were temporarily suspended in March 2000. Re-mobilization of these activities will begin on January 1, 2001. To support the re-mobilization date, your prompt review would be very greatly appreciated.

Sincerely,

Kenneth H. Weinhauer
Assistant Site Vice President

WKB
Attach.
cc - US NRC - Region III
NRC Senior Resident Inspector

ATTACHMENT 1

Letter from K. H. Weinhauer (NMC)

To

Document Control Desk (NRC)

Dated

October 13, 2000

Relief Request RR-G-4

KEWAUNEE NUCLEAR POWER PLANT
3RD TEN YEAR INTERVAL
RELIEF REQUEST NO. RR-G-4

1. Components for which Relief is Requested

Code Class:	Class 1, Class 2, and Class 3 pressure retaining items
Reference:	ASME Boiler and Pressure Vessel Code Section XI 1989 Edition Table IWB-2500-1, Table IWC-2500-1, and Table IWD-2500-1
Examination Category:	B-P, C-H, D-A, D-B, and D-C
Item Number:	As Applicable
Description:	As Applicable
Component Numbers:	As Applicable

2. Section XI Code Requirements

Hydrostatic pressure test for welded repairs or installation of replacement items by welding per the ASME Section XI, 1989 Edition, no addenda, Article IWA-4000.

3. Relief Requested

KNPP is requesting approval to use ASME Code Case N-416-2, "Alternative Pressure Test Requirement for Welded Repairs, Fabrication Welds for Replacement Parts and Piping Subassemblies, or Installation of Replacement Items by Welding, Class 1, 2, and 3 Section XI, Division 1," (Reference 1). Use of the code case is being requested for application to all Class 1, 2, and 3 ASME Section XI pressure retaining components within the scope of the KNPP Section XI ISI and Repair/Replacement Programs. This request also includes the repair/replacement welding activities that are associated with the upcoming KNPP steam generator replacement project. Code Case N-416-2 is applicable to the following welds associated with the replacement steam generator project:

- secondary side fabrication welds,
- secondary side piping installation welds,
- steam dome-to-transition cone installation girth welds,
- primary side safe end to channel head nozzle fabrication welds,
- primary side piping installation welds.

4. Basis for Relief

A. ASME Class 1, 2, and 3 Pressure Retaining Items

The basis for applying Code Case N-416-2 to the ASME Class 1, 2, and 3 pressure retaining items is identical to the basis submitted to the NRC for approval of Code Case N-416-1, shown in Reference 2. Below please see an excerpt taken from Reference 2 that discusses the basis for the request for N-416-1. The "Licensee's Basis for Request," Section 2.2, RR-G-3, Code Case N-416-1 reads:

> Satisfying this provision of the Code requires significant resources for planning, scheduling, maintenance, engineering, and procedure writing to address operational concerns and personnel and plant safety issues related to placing the plant in a non-conventional configuration to support, isolate, or obtain an above-normal operating pressure required for hydrostatic testing. This relief request is being submitted at this time, because of the ongoing hardship of performing hydrostatic pressure tests associated with repair and replacement activities. Hardships or unusual difficulties caused by hydrostatic pressure testing have been identified relating to operations, scheduling, and cost and are discussed herein.
>
> During hydrostatic testing, the affected system is unavailable to support plant operations, even if called upon to perform its safety function for the time required to isolate and align the system; perform fill and vent operations; connect an external pump and provide adequate relief capability for the system; maintain pressure for at least 4 hours for insulated components; install and remove blank flanges and jumpers; reinstall/test safety and relief valves; recalibrate instrumentation; and align the system for service; etc. Although hydrostatic testing is performed with the utmost of care, utilizing detailed procedures and trained personnel, there is a very small probability of damaging plant equipment, misaligning equipment, or experiencing some other unforeseen incident which could affect plant safety. Experience indicates that the approximate cost of hydrostatically testing a segment of piping ranges from $10,000 to $20,000 considering the support activities. As indicated above, this code requirement can have a significant effect on the flow and length of a refueling outage or unscheduled shutdown. Typically, hydrostatic pressure testing of a segment of piping would delay availability of the system, by at least two shifts, due to activities associated with tagout control, system line-up, fill and venting; etc.
>
> The alternative pressure test and NDE permitted by Code Case N-416-1 fulfill the same purpose as a hydrostatic pressure test, i.e., a check for component leakage at a reduced cost while increasing plant safety. Safety is increased when pressure testing is selected over hydrostatic testing because: 1) the affected system would be available to perform its safety function sooner, if needed, 2) the probability of challenging the pressure integrity of any affected component or causing an inadvertent actuation of a safety/relief valve or safety feature is reduced, and 3) the elimination of jumpers

and blank flanges reduces the possibility of damage to pipe connections and relief valves, which could cause system leakage or valve inoperability.

B. Kewaunee Steam Generator Replacement Project

The KNPP steam generator replacement project will install two (2) new steam generator lower assemblies (SGLAs), refurbish and reuse the existing steam domes, and modify the steam generator support structures and connecting piping/instrumentation systems to accommodate the new SGLAs. The replacement steam generators (RSGs) are comprised of Westinghouse model 54F lower units with refurbished steam drums and modified feedring/thermal sleeve assemblies. The Westinghouse model 54F RSGs are designed to be a like-in-kind replacement for the original Westinghouse model 51 steam generators. The RSGs are being designed by Westinghouse and manufactured by Ansaldo Energia in accordance with ASME Section III, 1986 Edition, 1987 Addenda. Westinghouse reconciled the overall design of the RSGs between the ASME Section III, 1986 Edition, 1987 Addenda, and the original steam generator code of record, ASME Section III Class A, 1965 Edition, Summer 1966 Addenda, Code Case No. 1429. Each SGLA is considered a Section III nuclear part. As such, each SGLA will be stamped with an ASME NPT stamp, by Ansaldo, prior to shipment to the Kewaunee plant.

The RSGs will be installed in the Kewaunee plant by completing the installation welds that will join the new SGLAs to the refurbished steam domes. Also, the primary and secondary piping installation welds will be completed as part of the steam generator replacement project. Bechtel Power Corporation and its subcontractors will perform the RSG installation. The installation will be performed in accordance with approved Directives and Procedures as required by the Kewaunee Operational Quality Assurance Program and the Kewaunee Repair/Replacement Program, which comply with ASME Section XI, 1989 Edition, no addenda.

The hydrostatic testing of NPT stamped parts installed as replacement items in N-stamped components is not required by the ASME Section III code. Also, ASME Section XI wording, prior to the 1999 ASME Code Addenda, only provides rules for the pressure testing of welded repairs and installation of items by welding (reference Section XI, IWA-4540 and Code Case N-416-1). Until the ASME approval of Code Case N-416-2, there was a hole between the published Construction Codes and Section XI, including published interpretations, into which the requirement for pressure testing of fabrication welds fell. ASME Code Case N-416-2 clarifies acceptable pressure testing and NDE requirements for these fabrication welds. Code Case N-416-2 permits replacement part fabrication welds to be pressure tested along with the installation welds.

Though the Section III code does not require hydrostatic testing of NPT stamped parts, the Kewaunee RSG Certified Design Specification imposed a SGLA primary side hydrostatic test in accordance with the requirements of the Section III construction code. A shop performed Section III hydrostatic test has been successfully performed on the primary side of each SGLA, by Ansaldo Energia, prior to shipment to the Kewaunee plant.

A Section III pressure boundary is established at the end of the carbon steel channel head primary nozzles. Prior to the steam generator replacement outage, the safe ends will be welded to the primary side channel head nozzles at the KNPP plant site. This process will be accomplished by Ansaldo Energia and its subcontractors. These welds will be performed in accordance with approved Directives and Procedures as required by the Kewaunee Operational Quality Assurance Program and the Kewaunee Repair/Replacement Program, which comply with ASME Section XI, 1989 Edition, no addenda. KNPP and its Authorized Nuclear Inspector (ANI) have agreed that these RSG channel head primary nozzle to safe end welds are fabrication welds. As stated above, these welds will be performed according to ASME Section XI. The Section III NPT stamp does not include these welds. If approved, KNPP will apply the leak test and NDE provisions specified in Code Case N-416-2 to these welds. If Code Case N-416-2 is not approved, KNPP will be required to perform an additional primary side hydrostatic test, in accordance with ASME Section XI, for these primary side welds.

A secondary side Section III shop hydrostatic test was originally specified in the RSG Certified Design Specification. The RSG fabrication schedule, at Ansaldo Energia, jeopardized the originally planned KNPP Spring 2000 steam generator replacement outage. In an effort to expedite the fabrication schedule, the voluntarily imposed secondary side hydrostatic pressure test, according to Section III, was removed from the design and fabrication specification. Continued fabrication schedule delays have caused the steam generator replacement outage to move to the Fall 2001. As such, a Section III, shop performed secondary side hydrostatic test will not be performed on the SGLAs.

A field performed Section XI hydrostatic test, of the RSG secondary sides, will result in a significant hardship to KNPP without a commensurate increase in the assurance of quality and safety of the fabrication and installation welds. A field performed Section XI hydrostatic test will require significant resources from planning, scheduling, maintenance, operations, engineering, health physics and construction. For example, these resources will be required to address plant systems design criteria, address system isolation design methods, design temporary pump/piping systems, and prepare procedures. Significant resources will also be required to address plant safety issues, personnel safety issues, and ALARA issues associated with the plant hydrostatic test configuration and conditions. Performing a RSG hydrostatic test could significantly impact the overall flow and length of the steam generator replacement outage. Activities required to isolate systems, configure temporary piping systems, install/remove blank flanges, install/remove temporary piping supports, perform fill and vent operations, install temporary external pumps and piping systems will require a substantial number of field support man-hours. Performing these field activities will result in a significant amount of accumulated radiation dose to steam generator replacement personnel.

Applying the alternative pressure test and NDE permitted by Code Case N-416-2, to the selected Kewaunee replacement steam generator welds, accomplish the same purpose as a hydrostatic test. Like the basis for the other Code Class 1, 2, and 3 components discussed

above, the code case and its associated NDE permit a leakage check at a slightly lower pressure. The alternative test methods and NDE discussed in the code case result in overall reduced cost, and reduced accumulated personnel radiation dose, while still ensuring the quality and safety of the selected replacement steam generator welds. As stated in the NRC's evaluation of Code Case N-416-1 in Reference 2, "hydrostatic pressure testing is primarily regarded as a means to enhance leakage detection during the examination of components under pressure, rather than solely as a measure to determine the structural integrity of the components. The industry indicates that experience has demonstrated that leaks are not being discovered as a result of hydrostatic test pressures propagating a preexisting flaw through wall. They indicate that leaks in most cases are being found when the system is at normal operating pressure." The above discussion and the NRC's evaluation of the earlier version of this code case directly support the basis of using Code Case N-416-2.

5. Alternative Examinations

Implement the criteria defined in items (a), (b), and (c) below as directly taken from Code Case N-416-2, "Alternative Pressure Test Requirement for Welded Repairs, Fabrication Welds for Replacement Parts and Piping Subassemblies, or Installation of Replacement Items by Welding, Class 1, 2, and 3 Section XI, Division 1."

Additionally, KNPP proposes to continue to apply the additional NDE of Class 3 components, defined in (d) below, as approved by the NRC in Reference 2. Reference 2 summarizes the NRC's approval of Kewaunee's use of Code Case N-416-1.

(a) NDE shall be performed on welded repairs and fabrication and installation joints in accordance with the methods and acceptance criteria of the applicable Subsection of the 1992 Edition of Section III.

(b) Prior to or immediately upon return to service, a visual examination (VT-2) shall be performed on welded repairs and fabrication and installation joints in conjunction with a system leakage test, using the 1992 Edition of Section XI, in accordance with para. IWA-5000, at nominal operating pressure and temperature.

(c) Use of this Case shall be documented on an NIS-2 form.

(d) The root (pass) layer of socket and butt welds on the pressure retaining boundary of Class 3 components shall be subject to either a surface examination or volumetric examination of the final weld at the owner's option.

6. Implementation Period

For the duration of the Kewaunee Nuclear Power Plant 3rd Ten Year Interval.