

April 04, 2006

Mr. Rick A. Muench
President and Chief Executive Officer
Wolf Creek Nuclear Operating Corporation
Post Office Box 411
Burlington, KS 66839

SUBJECT: WOLF CREEK GENERATING STATION - RE: AUTHORIZATION OF RELIEF
REQUEST I2R-33 FOR THE SECOND 10-YEAR INTERVAL (TAC NO. MC9515)

Dear Mr. Muench:

By letter dated November 22, 2005 (ET 05-0027), the Wolf Creek Nuclear Operating Corporation (the licensee) requested relief from certain examination coverage requirements of Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (i.e., the ASME Code) for the Wolf Creek Generating Station (WCGS). Relief Request (RR) I2R-33 was submitted to obtain relief from the ASME Code inspection requirements for Section XI, Class 1, Table IWB-2500-1, Examination Category B-D, Item No. B3.90, nozzles-to-vessel welds for the second 10-year interval. The requested relief is applicable to four hot-leg nozzle welds and pertains to the limited volumetric examination conducted for each of the welds due to the configuration of the welds where the "essentially 100 percent" coverage could not be obtained.

Based on the enclosed safety evaluation, the Nuclear Regulatory Commission staff concludes that the ASME Code-examination requirements are impractical, that no alternate requirements are needed, and that the relief requested is authorized by law and will not endanger life, 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. Based on this, RR I2R-33 is granted pursuant to 10 CFR 50.55a(g)(6)(i).

Sincerely,

/RA/

David Terao, Chief
Plant Licensing Branch IV
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-482

Enclosure: Safety Evaluation

cc w/encl: See next page

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO REQUEST FOR RELIEF NO. I2R-33

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

1.0 INTRODUCTION

By letter dated November 22, 2005 (Agencywide Documents Access and Management System Accession No. ML053340299), the Wolf Creek Nuclear Operating Corporation (the licensee) requested relief from certain volumetric examination requirements in Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (the ASME Code) at Wolf Creek Generating Station (WCGS). Section XI, 1989 Edition for weld examinations of the outlet nozzle-to-vessel welds for the second 10-year inspection interval. The relief requested is for the weld examinations of all four outlet nozzle-to-vessel welds and pertains to the limited volumetric examination conducted for each of the welds due to the configuration of the welds where the "essentially 100 percent" coverage could not be obtained. The relief is with respect to the requirements of the 1989 Edition of the ASME Code, Section XI, pursuant to 10 CFR 50.55a(g)(6)(i).

The licensee performed these examinations as part of the inservice inspection (ISI) program during the second 10-year inspection interval of WCGS, which ended on September 2, 2005, and the relief request is for that interval. The request was made in part pursuant to Paragraph 55a(g)(5)(iv) of Part 50, Title 10 of the *Code of Federal Regulations* (10 CFR), which requires the basis of a relief request based on impracticability to be demonstrated no later than 12 months after the 10-year inspection interval has ended. This relief request was submitted to meet this requirement.

The licensee stated that the applicable ISI Code of Record for the second 10-year ISI interval of WCGS, which ended September 2, 2005, is the 1989 Edition of Section XI, no Addenda. Pursuant to 10 CFR 50.55a(g)(5)(iv), the licensee is requesting NRC approval of its relief within 12 months after the expiration of the second 10-year ISI interval.

2.0 BACKGROUND

The ISI of ASME Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Code and applicable addenda as required by 10 CFR 50.55a(g). The only exception is where specific written relief has been granted by the Nuclear Regulatory Commission (NRC) pursuant to 10 CFR 50.55a(g)(6)(i), where it determines that it is impractical to meet ASME Code requirements, although the Commission may impose such alternate requirements as it determines necessary, such that the 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 ASME Code requirements were imposed on the facility. Section 50.55a(a)(3) also states, among other things, that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if the licensee demonstrates that (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 difficulty without a compensating increase in the level of quality and safety.

In addition, 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. Section 50.55a(g)(4)(i) requires 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) 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein.

3.0 EVALUATION OF RR I2R-33

3.1 Items for Which Relief is Requested

The licensee provided the following table that lists the reactor pressure vessel pressure-retaining nozzle-to-vessel welds for which the relief in RR I2R-33 has been requested:

Weld ID No.	Description	ASME Code Item	Combined Coverage
RV-107-121-A	Loop A Outlet Nozzle to Vessel Weld	B3.90	80.27%
RV-107-121-B	Loop B Outlet Nozzle to Vessel Weld	B3.90	80.27%
RV-107-121-C	Loop C Outlet Nozzle to Vessel Weld	B3.90	80.27%
RV-107-121-D	Loop D Outlet Nozzle to Vessel Weld	B3.90	80.27%

3.2 Code Requirements

The ASME Code Section XI, 1989 Edition, Table IWB-2500-1, Examination Category B-D, Item No. B3.90, nozzle-to-vessel welds, requires volumetric examination of essentially 100 percent of the examination volume identified in Figure IWB-2500-7(a). In addition, ultrasonic examinations must be performed using procedures, personnel, and equipment qualified to the requirements of Appendix VIII of the ASME Code, Section XI, 1995 Edition with the 1996 Addenda, "Performance Demonstration for Ultrasonic Examination Systems."

3.3 Licensee's Proposed Alternative

The licensee requested relief for a limited scan of 80.27 percent combined volumetric coverage of the bore and transverse scans in lieu of the essentially 100 percent volumetric coverage requirement for each of the welds identified in the table in Section 3.1 of this safety evaluation (SE). The licensee proposed the following alternative inspections during the second 10-year ISI interval in lieu of the ASME Code-required examination coverage shown in Figure IWB-2500-7(a):

- (1) The performance of qualified volumetric examination of the subject welds to the maximum extent practical due to the design configuration restrictions of the welds.
- (2) Visual examinations that were performed as required under ASME Code, Section XI, Category B-N-1 and no degradation was identified.
- (3) A visual examination (VT-2) during system pressure test that was performed as required under Examination Code Category B-P of the ASME Code, Section XI, with no evidence of leakage identified.

3.4 Basis for Relief

In providing its basis for the requested relief, the licensee stated the following in its application:

The basis for use of these alternatives is that they provide the best examination coverage possible within the limitations of the current design configuration. The volumetric examination was performed using a system (procedures, personnel, and equipment) qualified in accordance with Appendix VIII, Supplements 4, 6, and 7.

3.5 Evaluation

The reactor vessel outlet nozzle-to-vessel welds require essentially 100 percent volumetric examinations during each inspection interval in accordance with the applicable ASME Code, Section XI. The licensee stated that, during the Cycle 14 refueling outage in 2005, the outlet nozzle-to-vessel welds were examined by remote tooling from the nozzle bore and from the vessel shell interior using circular and radial scanning paths around the nozzle opening to examine for transverse defects and defects parallel to the weld axis. The combined perpendicular coverage was estimated by the licensee at 92.51 percent and the combined parallel coverage is estimated at 68.04 percent, resulting in a combined average of 80.27 percent (see the table in Section 3.1 of this SE). The licensee stated that it examined the welds to the extent practical, but it could not obtain the "essentially" 100 percent coverage required by the ASME Code. This was the reason for the licensee's requested relief.

The NRC staff evaluated the impact of limited volumetric examination coverage on the structural integrity of the welds. In assessing the structural integrity of the welds in the hot-leg nozzle to vessel affected by this relief request, the NRC staff examined issues of active degradation mechanisms, the likelihood of a flaw existing in the subject welds, and the growth of an existing flaw necessary to cause a failure during the second 10-year inspection interval.

The factors considered were:

- (1) The outlet nozzle-to-vessel welds for which relief from ASME Code-required examination coverage is requested are composed of low-alloy carbon steel which is not susceptible to stress-corrosion cracking in the exposed environment. There is no degradation mechanism other than fatigue active in the subject welds which would cause a failure of the weld. Furthermore, the examination conducted for each weld provides reasonable assurance of structural integrity of the weld since fatigue-type cracks in the weld would likely have been detected during examination of the accessible volume of the weld.
- (2) The system pressure test, routinely conducted at the end of each refueling outage prior to operation, will likely result in the detection of a leak before any gross failure occurs.

Based on the above, the NRC staff has determined that the alternate inspections, of limited volumetric examination and tests conducted during the second 10-year ISI interval, provide reasonable assurance of structural integrity of the reactor vessel outlet nozzle-to-vessel welds at WCGS.

The NRC staff has determined that performance of the ASME Code-required examination in this particular case is impractical, due to weld and component configuration as described in the licensee's application by the estimated combined perpendicular and parallel coverage. In order to comply with the ASME Code requirement, the licensee would have to perform a design modification of the piping system, which would impose a significant burden on the licensee. Because the alternate inspections performed by the licensee provide reasonable assurance of structural integrity of the reactor vessel outlet nozzle-to-vessel welds, the NRC has no need to impose alternate requirements.

4.0 CONCLUSION

Based on the above evaluation, the NRC staff concludes that the licensee has provided reasonable assurance that (1) it has to the extent practical maximized the examination coverage of the subject welds and (2) its alternative inspections provide reasonable assurance of the structural integrity of the welds. Based on these conclusions, the NRC staff further concludes that the ASME Code-examination requirements are impractical, that no alternate requirements are needed, and that the relief requested is authorized by law and will not endanger life, 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. Based on this, RR I2R-33 is granted pursuant to 10 CFR 50.55a(g)(6)(i).

All other ASME Code, Section XI, requirements for which relief was not specifically requested and approved in this or any other relief request, remain applicable, including a third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: Nihar Ray

Date: April 04, 2006

Wolf Creek Generating Station

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