WOLF CREEK
NUCLEAR OPERATING CORPORATION

September 16, 2008

Terry J. Garrett
Vice President Engineering

ET 08-0044

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

Subject: Docket No. 50-482: 10 CFR 50.55a Request I3R-06, Alternative to the Examination Requirements of ASME Section XI for Class 1 Piping Welds Examined from the Inside of the Reactor Vessel

Gentlemen:

Pursuant to 10 CFR 50.55a(a)(3)(i), Wolf Creek Nuclear Operating Corporation (WCNOC) hereby requests Nuclear Regulatory Commission (NRC) approval of the attached 10 CFR 50.55a Request for the Third Ten-Year Interval of WCNOC's Inservice Inspection (ISI) Program.

The attached 10 CFR 50.55a Request (I3R-06) requests alternatives to the requirements of ASME Section XI for Class 1 Piping Welds Examined from the Inside of the Reactor Vessel. The proposed alternatives provide an acceptable level of quality and safety as required by 10 CFR 50.55a(a)(3)(i).

WCNOC requests approval of the attached 10 CFR 50.55a Request by July 31, 2009, to support task planning and establishing contracts and resources for Refueling Outage 17 (RF17). RF17 is scheduled to begin on October 10, 2009.

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NRR

There are no commitments contained within this letter. If you have any questions, please contact me at (620) 364-4084 or Mr. Richard Flannigan at (620) 364-4117.

Sincerely,

Jamey D. Ratzlaff FOR TJG

Terry J. Garrett

TJG/rlt

Attachment: 10 CFR 50.55a Request I3R-06

cc: E. E. Collins (NRC), w/a
V. G. Gaddy (NRC), w/a
B. K. Singal (NRC), w/a
Senior Resident Inspector (NRC), w/a

Wolf Creek Nuclear Operating Corporation
10 CFR 50.55a Request I3R-06,
Alternative to the Examination Requirements of
ASME Section XI for Class 1 Piping Welds
Examined from the Inside of the Reactor Vessel

10 CFR 50.55a Request Number I3R-06

Proposed Alternative
In Accordance with 10 CFR 50.55a(a)(3)(i)

Alternative Provides Acceptable Level of Quality and Safety

1. ASME Code Components Affected

Class 1 Risk-Informed Inservice Inspection (RI-ISI) pressure retaining piping welds examined from the inside surface of the reactor pressure vessel (RPV) using procedures, personnel, and equipment qualified to ASME Section XI, Appendix VIII, Supplement 2 or 10 criteria.

SAFE-END DISSIMILAR METAL WELDS CODE CATEGORY R-A
(Formerly CODE CATEGORY B-F)

Code Item (Note 1)	Description	Weld No.
R1.20	Safe-end to Loop A RPV Outlet Nozzle	RV-301-121-A
R1.20	Safe-end to Loop A RPV Inlet Nozzle	RV-302-121-A, Note 3
R1.20	Safe-end to Loop B RPV Outlet Nozzle	RV-301-121-B
R1.20	Safe-end to Loop B RPV Inlet Nozzle	RV-302-121-B, Note 3
R1.20	Safe-end to Loop C RPV Outlet Nozzle	RV-301-121-C
R1.20	Safe-end to Loop C RPV Inlet Nozzle	RV-302-121-C, Note 3
R1.20	Safe-end to Loop D RPV Outlet Nozzle	RV-301-121-D
R1.20	Safe-end to Loop D RPV Inlet Nozzle	RV-302-121-D, Note 3

SAFE-END PIPING WELDS CODE CATEGORY R-A
(Formerly CODE CATEGORY B-J)

Code Item (Note 2)	Description	Weld No. (Note 3)
R1.20	Elbow to Loop A RPV Inlet Safe-End Weld	BB-01-F102
R1.20	Pipe to Loop A RPV Outlet Safe-End Weld	BB-01-F103
R1.20	Elbow to Loop B RPV Inlet Safe-End Weld	BB-01-F202
R1.20	Pipe to Loop B RPV Outlet Safe-End Weld	BB-01-F203
R1.20	Elbow to Loop C RPV Inlet Safe-End Weld	BB-01-F302
R1.20	Pipe to Loop C RPV Outlet Safe-End Weld	BB-01-F303
R1.20	Elbow to Loop D RPV Inlet Safe-End Weld	BB-01-F402
R1.20	Pipe to Loop D RPV Outlet Safe-End Weld	BB-01-F403

Note 1: These welds were formerly Item B5.10.
Note 2: These welds were formerly Item B9.11.
Note 3: During the Second Ten-Year Interval of Wolf Creek Nuclear Operating Corporation's (WCNOC) ISI Program, these locations had surface conditions that limited the detection of axial flaws by Ultrasonic Testing (UT).

2. Applicable Code Edition and Addenda

ASME Boiler and Pressure Vessel Code, Section XI 1998 Edition through 2000 Addenda.

3. Applicable Code Requirement

Examination Category R-A, items R1.20 (formerly Code Categories B-F, B5.10 and B-J, B9.11 in the 1998 Edition through 2000 Addenda) specifies volumetric examination. This volumetric examination is conducted in accordance with Appendix VIII, Supplements 10 and 2, with the alternative requirements of approved Code Cases N-695 and N-696.

4. Reason for Request

Two alternatives are requested:

Requested Alternative A:

Alternative to the 0.125 inch root mean square error (RMSE) depth sizing requirement of Appendix VIII, Supplements 10 and 2, with the alternative requirements of Code Cases N-695 and N-696.

To date, although examination vendors have qualified for detection and length sizing on these welds, the examination vendors have not met the established RMSE of 0.125 inch for depth sizing.

Wolf Creek Nuclear Operating Corporation (WCNOC) proposes to use a contracted examination vendor that has demonstrated the ability to meet a depth sizing qualification requirement with an RMSE of 0.189 inch instead of the 0.125 inch required for Supplement 10 and Code Case N-695, and an RMSE of 0.245 inch instead of the 0.125 inch for Supplements 10 and 2 combined, as per Code Case N-696.

Requested Alternative B:

Alternative to supplement the ultrasonic test (UT) method with eddy current examinations when performing examinations of the Code specified pipe weld volumes from the inside diameter (ID) surface due to existing ID configurations.

The examination vendor for the Wolf Creek Generating Station (WCGS) reactor vessel nozzle examinations has been qualified for detection of circumferential flaws in accordance with Appendix VIII, Supplements 10 and 2 with the alternative requirements of Code Cases N-695 and N-696, as demonstrated through the Electric Power Research Institute (EPRI) Performance Demonstration Initiative (PDI) Program, for nozzle-to-safe end and safe end-to-pipe welds examined from the ID surface. The vendor is similarly qualified for the detection of axial flaws provided the

surface is machined or ground smooth with no exposed root reinforcement or counter-bore. Surface roughness is present that will call into question the ultrasonic qualifications demonstrated for detection of axial flaws.

The examination vendor has developed an eddy current technique to augment the ultrasonic examination method and provide increased sensitivity at the ID surface. The eddy current technique was first used in the VC Summer reactor vessel primary nozzle examinations of 2000. The procedure was refined after its first use in 2000 by applying it to the VC Summer hot leg dissimilar metal weld section removed from service. The removed section had a number of primary water stress corrosion cracking flaws along with non-relevant indications resulting from metallurgical interface and surface geometry. Using these actual flaws and geometric conditions in the removed section to refine the technique, the vendor developed a reliable flaw-screening criteria which allowed for the successful use of the procedure in the VC Summer 2002 and 2003 examinations.

Since that time, the technique has been successfully blind tested for the Swedish authority SQC Kvaleficeringscentrum AB (SQC NDT Qualification Center) under the program, "Qualification of Equipment, Procedure and Personnel for Detection, Characterization and Sizing of Defects in Areas in Nozzle to Safe End Welds at Ringhals Unit 3 and 4," Hakan Soderstrand 7-10-03. The important qualification parameters for Eddy Current in the SQC blind tests were as follows:

-Defect types: fatigue and stress corrosion cracks, surface initiated
-Tilt: +/-10 degrees; Skew: +/-10 degrees
-Detection target size: IDSCC 6mm(0.25 inch) long
-Flaw Location: within 10mm (13/32 inch)
-Length of the planer flaw within a 70% confidence interval:+/-9mm (3/8 inch)
-False call rate: less than or equal to 20% for the personnel qualification tests

(Ref. SQC Qualification Report No. 019A/03)

This technique has also been used to supplement examination of portions of the relevant near-surface volumes during the last 15 domestic pressurized water reactor nozzle-to-pipe examinations conducted by the vendor.

5. Proposed Alternative and Basis for Use

Requested Alternative A:

WCNOC proposes to use approved Code Cases N-695 and N-696 with a combined RMSE of 0.245 inch instead of the 0.125 inch specified for depth sizing in the Code Cases. In the event an indication is detected that requires depth sizing, the 0.120 inch difference between the required RMSE and the demonstrated RMSE (0.245 inch – 0.125 inch = 0.120 inch) will be added to the measured through-wall extent for comparison with applicable acceptance criteria. If the examination vendor demonstrates an improved depth sizing RMSE prior to the examination, the excess of that improved RMSE over the 0.125 inch RMSE requirement, if any, will be added to the measured value for comparison with applicable acceptance criteria.

The proposed alternative assures that the nozzle-to-safe end welds and the subject reactor coolant piping circumferential welds will be fully examined by procedures, personnel and equipment qualified by demonstration in all aspects except depth sizing. For depth sizing, the proposed addition of the difference between the qualified and demonstrated sizing tolerance to any flaw required to be sized compensates for the potential variation and provides an acceptable level of quality and safety in accordance with 10 CFR 50.55a(a)(3)(i).

Use of the combined qualification requirements for Supplements 2 and 10 prior to availability of Code Case N-696, and the concept of adding the difference between the required RMSE value and the demonstrated RMSE value to the indication depth, were separately approved for the V.C. Summer Station by NRC letter dated February 3, 2004 (ML040340450).

Requested Alternative B:

In refueling outage RF14 of ISI Interval 2, WCNOC found that 12 of the 16 components identified above had inside surface conditions that did not allow coverage to be claimed for detection of axial flaws. Use of the below alternative was approved for the second ISI Interval by the NRC in a letter dated December 27, 2006 (ML063470082). WCNOC proposes to continue the use of this alternative in the third ISI Interval.

WCNOC proposes using surface geometry profiling software (profilometry) in conjunction with a focused immersion ultrasonic transducer positioned to permit accurate profile data across the examination volume to help the examiner confirm locations where the raw data indicates lack of transducer contact due to problematic surface geometry. Eddy current examination will be used to supplement ultrasonic examination for all nozzle-to-safe end and safe end-to-pipe welds. Profilometry will be used to determine the surface areas, and confirm those previously identified, where roughness may limit the ability of ultrasonic methods to be used effectively as qualified through performance demonstration.

The eddy current method will be used to assure any axial flaws at the ID surface volume that could be missed by ultrasonic examination due to potential surface roughness are detected. As a compliment to ultrasonic examinations for rough surface detection coverage, the following eddy current techniques will be utilized:

-Up to two plus point probes applied circumferentially on the pipe inside surface in scan increments of 0.080 inch circumferentially (for axial flaws) and 0.25 inch axially.

-Automated systems for data collection and analysis

The target flaw size for the eddy current procedure is 0.28 inch long, well within the ASME Code linear flaw acceptance standards of 0.45 inches for austenitic material, and 0.625 inch for ferritic material (defined for the outside surface in the Code Tables). All eight nozzle-to-safe end welds and all eight safe end-to-pipe welds will be examined.

The ultrasonic examinations supplemented by eddy current examinations and profilometry will be conducted to the maximum extent practical and are subject to third party review by the Authorized Nuclear Inservice Inspector.

Use of ultrasonic profilometry and eddy current examination with procedures and personnel qualified through the SQC blind tests to supplement Appendix VIII qualified ultrasonic procedures and personnel for the nozzle-to-safe end and safe end-to-pipe welds provides additional assurance that surface-breaking flaws that may be present would be detected in the presence of potential surface roughness, resulting in an equivalent or better level of quality and safety than that currently qualified to meet ASME Code requirements in accordance with 10 CFR 50.55a(a)(3)(i). The proposed alternative was approved for the Surry Power Station by NRC letter dated October 16, 2004 (ML042950444). The proposed alternative was also approved for the second ISI Interval of the Wolf Creek Generating Station by NRC letter dated December 27,2006 (ML063470082).

6. Duration of Proposed Alternative

The proposed alternative is for the third inspection interval that begins on September 3, 2005 and ends on September 2, 2015.

7. Precedents

Requested Alternative A:

The proposed alternative for the use of the combined qualification requirements for Supplements 10 and 2 prior to the availability of Code Case N-696, and the concept of adding the difference between the required RMSE value and the demonstrated value to the measured indication depth, were separately approved for the V.C. Summer Station by NRC letter dated February 3, 2004, (ML040340450).

Requested Alternative B:

The proposed alternative was approved for profilometry and eddy current for the Surry Power Station by NRC letter dated October 16, 2004 (ML042950444). The proposed alternative was also approved for the second ISI Interval of the Wolf Creek Generating Station by NRC letter dated December 27,2006 (ML063470082).