

WOLF CREEK

NUCLEAR OPERATING CORPORATION

Terry J. Garrett
Vice President Engineering

April 23, 2009

ET 09-0014

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

Reference: 1) Letter ET 08-0044, dated September 16, 2008, from T. J. Garrett, WCNOG, to USNRC

2) Letter dated March 27, 2009, from B. K. Singal, USNRC, to R. A. Muench, WCNOG

Subject: Docket No. 50-482: Wolf Creek Nuclear Operating Corporation's Response to Request for Additional Information Regarding 10 CFR 50.55a Request I3R-06

Gentlemen:

Reference 1 provided Wolf Creek Nuclear Operating Corporation (WCNOG) 10 CFR 50.55a Request I3R-06, which requested alternatives to the requirements of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI for Class 1 piping welds examined from the inside of the reactor vessel.

On February 23, 2009, the Nuclear Regulatory Commission (NRC) Project Manager for WCNOG provided by electronic mail a draft request for additional information (RAI) regarding 10 CFR 50.55a (Relief) Request I3R-06. A follow-up telephone discussion between the NRC and WCNOG staff was conducted on March 5, 2009, for additional clarification of the RAI, at which time it was agreed that WCNOG would provide its response within 30 days from the NRC letter providing the RAI. Reference 2 provided the NRC letter and RAI. Attachment I lists each request/question contained in the NRC RAI followed by WCNOG's response.

Attachment II contains sketches of the subject welds as requested in RAI Request Item 1.

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NRR

This letter contains no commitments. If you have any questions concerning this matter, please contact me at (620) 364-4084, or Mr. Richard D. Flannigan at (620) 364-4117.

Sincerely,



Terry J. Garrett

TJG/rlt

Attachments: I Response to Request for Additional Information Regarding 10 CFR 50.55a
(Relief) Request I3R-06
II Sketches of the Subject Welds as Requested in RAI Request Item 1

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

**Response to Request for Additional Information Regarding
10 CFR 50.55a (Relief) Request I3R-06**

Wolf Creek Nuclear Operating Corporation (WCNOC) Letter ET 08-0044 (Reference 1), dated September 16, 2008, submitted 10 CFR 50.55a Request I3R-06, which requested alternatives to the examination requirements of American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI for Class 1 piping welds examined from the inside of the reactor vessel. WCNOC 10 CFR 50.55a Request I3R-06 proposed an alternative to the depth sizing error requirements of ASME Code Cases N-695 and N-696, and also proposed an 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, for the third 10-year inservice inspection interval at Wolf Creek Generating Station (WCGS).

NRC letter dated March 27, 2009 (Reference 2), provided an NRC request for additional information (RAI) regarding WCNOC 10 CFR 50.55a Request I3R-06. Provided below is a list of each request/question (in italicized font) contained in the NRC RAI followed by WCNOC's response (in bold font).

Flaw Depth Sizing Alternative

1. *Page 1 of the application identified welds as either Category B-F or Category B-J. Please provide representative sketches of the configurations and identify the weld and base material (carbon steel, stainless steel, Inconel, etc). Include in the sketches the impediments that are preventing the Code-required examinations.*

WCNOC Response:

See Attachment II.

2. *Page 4 of the application indicates that these welds were examined during fourteenth refueling outage (RF14). If the vendor being used for the welds in this request is the same vendor that was used for RF14, please provide a discussion on the vendor's efforts to satisfy the Code-required root mean square error (RMSE) since RF14.*

WCNOC Response:

The vendor has demonstrated the ability to meet a depth sizing qualification requirement with an RMSE of 0.189 inches instead of the 0.125 inches required by Supplement 10, and an RMSE of 0.245 inches instead of the 0.125 inches required for Supplements 10 and 2 combined as per approved Code Case N-696. Since Refueling Outage 14, no further effort has been made by this vendor to improve their RMSE.

3. *The Electric Power Research Institute (EPRI) - PDI identified a surface roughness criterion of 1/32-inch gap beneath the transducer for ultrasonic testing (UT) examinations. The inside diameter (ID) surface roughness of many of PDI's test specimens used for ID performance demonstrations are outside this standard. Having test specimens with an acceptable ID surface provides an opportunity for qualifying to the Code-required 0.125-inch RMSE. The availability of test specimens with acceptable ID surfaces is the responsibility of the entity desiring to use these test specimens in their performance demonstrations. Please discuss the vendor's depth sizing RMSE capabilities when using test specimens made with acceptable ID surfaces.*

WCNOC Response:

Based on discussions with EPRI, it is WCNOC's position that the roughness criterion of 1/32-inch gap beneath the transducer for UT examinations established by PDI was applicable to outside diameter (OD) examinations only, and is not applicable to ID examinations like those addressed by 10 CFR 50.55a (Relief) Request I3R-06.

The vendor performed demonstrations on shop simulated (smooth ID) dissimilar metal welds and on field simulated (rough ID) dissimilar metal welds at EPRI. There are currently no austenitic field weld samples with smooth ID surfaces available. The vendor performance did not meet the 0.125 inch RMSE for depth sizing.

Surface condition is only part of what creates difficulty for a Supplement 10 ID examination to achieve a 0.125 inch RMSE sizing capability. These welds are typically in close proximity to other austenitic piping welds, which creates a situation where sound must be transmitted partially through an adjacent austenitic weld in order to size deeper flaws. Additionally, the primary cooling water piping welds that are examined from the ID are typically very thick (approximately 2.5 inches). Trying to achieve a 0.125 inch RMSE for depth sizing over the full thickness of thick piping welds is also very difficult, regardless of surface condition or other limitations. For this combination of reasons, the industry came up with the methodology of tracking the sizing capability for the ID examination procedures and applying the difference between the actual RMSE and the Code required RMSE to the sizing performed from the ID. This way, even though the procedure does not meet the Code required 0.125 inch RMSE, an error factor can be added to the flaw size determined during the examination in order to apply a level of conservatism to the measurement.

4. *The PDI program test specimens contain ID surface roughness that existed in the field prior to utilities implementing risk-informed inservice inspection (RI ISI) programs. These test specimens normally exceed the 1/32-inch gap between the transducer and surface that PDI determined as acceptable for UT examination. For RI ISI programs, the ID surfaces should be conducive to UT examinations. In the event that a flaw is detected, please discuss your efforts to*

provide a surface roughness that supports a vendor's 0.125-inch RMSE qualifications.

WCNOC Response:

To provide a smooth (machined) surface on the ID of the subject welds would result in a hardship/unusual difficulty without a compensating increase in the level of quality and safety. The nominal thickness of the piping welds, which are the subject of this relief, range from 2.32" to 2.94". The difference between the demonstrated RMSE (0.245") and the Code required RMSE (0.125") is 0.120", which is approximately 5% of the thinnest nominal wall. The amount of radiation dose and resources necessary to achieve a smooth surface is not commensurate with the increase in the level of quality and safety.

Adding the difference between the actual demonstrated RMSE and the Code required RMSE to the flaw size is a conservative measure that will ensure the integrity of the subject piping. This alternative provides an acceptable level of quality and safety.

Flaw Detection Alternative

During RF14, the NRC granted WCNOC a similar relief on these welds in a letter dated December 27, 2006 (ADAMS Accession No. ML063470082). The relief was based on a partial UT examination combined with a supplemental eddy current testing examination and visual examination. In the WCNOC letter dated September 16, 2008, no visual examination is included in the proposed alternative. Please clarify if a visual examination is to be performed and, if not, please detail how the same level of safety will be accomplished.

WCNOC Response:

A Category B-P VT-2 examination is scheduled to be performed as required by ASME Section XI, per 10 CFR 50.55a.

References:

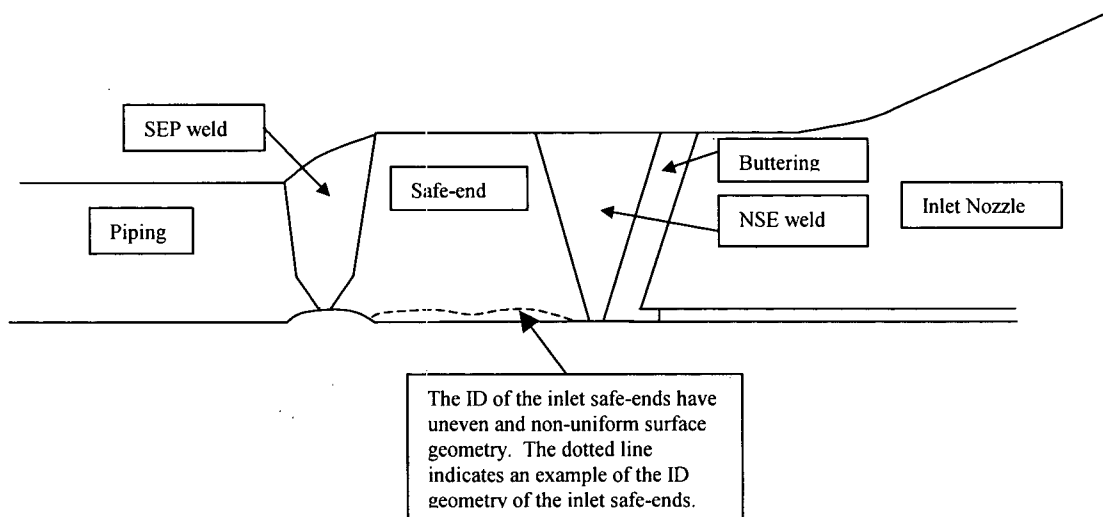
1. WCNOC Letter ET 08-0044, dated September 16, 2008, from T. J. Garrett, WCNOC, to USNRC, "10 CFR 50.55a Request I3R-06, Alternative to the Examination Requirements of ASME Section XI for Class 1 Piping Welds Examined from the Inside of the Reactor Vessel."
2. NRC Letter dated March 27, 2009, from B. K. Singal, USNRC, to R. A. Muench, WCNOC, "WOLF CREEK GENERATING STATION – REQUEST FOR ADDITIONAL INFORMATION RE: RELIEF 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 (TAC NO. MD9658)."

**Sketches of the Subject Welds as Requested in Request for Additional
Information (RAI) Request Item 1**

Component	Nozzle	Butter	NSE weld	Safe-end	SEP weld	pipe
Material	SA 508 Class 2	Alloy 82/182	Alloy 82/182	SA 182 F316	308	SA351 CF8A

NSE=Nozzle to safe-end
SEP=Safe-end to piping

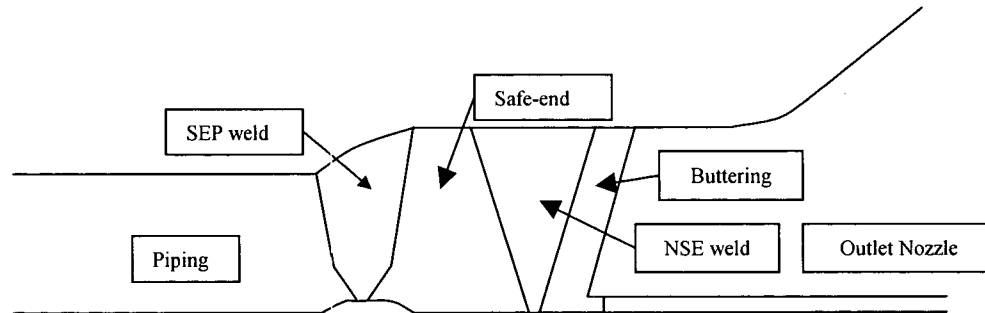
Figure 1
Inlet piping to safe-end and safe-end to inlet nozzle welds
(Not to scale)



Note: Vendors are unable to meet the Code requirement for depth sizing of 0.125 inch RMSE for configurations typical of the above when performing examinations from the Inside Diameter (ID).

Nozzle to Safe-end (NSE) welds	Safe-end to Pipe (SEP) welds
RV-302-121-A	BB-01-F102
RV-302-121-B	BB-01-F202
RV-302-121-C	BB-01-F302
RV-302-121-D	BB-01-F402

Figure 2
Outlet nozzle to safe-end and safe-end to outlet piping welds
(Not to scale)



Note: Vendors are unable to meet the Code requirement for depth sizing of 0.125 inch RMSE for configurations typical of the above when performing examinations from the ID.

Nozzle to Safe-end (NSE) welds	Safe-end to Pipe (SEP) welds
RV-301-121-A	BB-01-F103
RV-301-121-B	BB-01-F203
RV-301-121-C	BB-01-F303
RV-301-121-D	BB-01-F403