



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
OF THE FIRST 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN

REQUESTS FOR RELIEF NOS. IIR-40, 41, 42, 43, AND 44

WOLF CREEK NUCLEAR OPERATING CORPORATION

WOLF CREEK GENERATING STATION

DOCKET NO. 50-482

1.0 INTRODUCTION

The Technical Specifications for Wolf Creek Generating Station state that the inservice inspection of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components shall be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code and applicable Addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). Section 50.55a(a)(3) of Title 10 of the Code of Federal Regulations states that alternatives to the requirements of paragraph (g) may be used, when authorized by the NRC, if (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 difficulties without a compensating increase in the level of quality and safety.

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. The regulations require 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) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The applicable edition of Section XI of the ASME Code for the Wolf Creek Generating Station first 10-year inservice inspection (ISI) interval is the 1980 Edition through Winter 1980 Addenda except that the extent of examination for Code Class 2 piping welds has been determined by the 1974 Edition through Summer 1975 Addenda (74S75) as permitted by 10 CFR 50.55a(b). The components (including supports) may meet the requirements set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Commission approval.

Pursuant to 10 CFR 50.55a(g)(5), if the licensee determines that conformance with an examination requirement of Section XI of the ASME Code is not practical for its facility, information shall be submitted to the Commission in support of that determination and a request made for relief from the ASME Code requirement. After evaluation of the determination, pursuant to 10 CFR 50.55a(g)(6)(i), the Commission may grant relief and may impose alternative requirements that are determined to be authorized by law, will not endanger life, property, or the common defense and security, and are otherwise in the public interest, giving due consideration to the burden upon the licensee that could result if the requirements were imposed. In a letter dated March 28, 1995, Wolf Creek Nuclear Operating Corporation submitted to the NRC its first 10-year interval inservice inspection program plan, Requests for Relief Nos. IIR-40, IIR-41, IIR-42, IIR-43, and IIR-44 for the Wolf Creek Generating Station.

2.0 EVALUATION

The staff, with technical assistance from its contractor, the Idaho National Engineering Laboratory (INEL), has evaluated the information provided by the licensee in support of its first 10-year interval inservice inspection program plan, Requests for Relief Nos. IIR-40, IIR-41, IIR-42, IIR-43, and IIR-44 for the Wolf Creek Generating Station.

3.0 CONCLUSION

Based on the information submitted, the staff adopts the contractor's conclusions and recommendations presented in the Technical Letter Report attached. The staff concludes that the Code requirement is impractical, is a burden on the licensee, and the proposed alternative testing would provide a reasonable assurance of operational readiness of the subject systems contained in the licensee's requests for relief. Therefore, relief is granted for IIR-41, IIR-42, and IIR-43, pursuant to 10 CFR 50.55a(g)(6)(i).

The staff has concluded based on the information provided that for IIR-44, the licensee has demonstrated that specific Section XI requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. Therefore, the alternative contained in IIR-44 is authorized, pursuant to 10 CFR 50.55a(a)(3)(ii).

The staff has concluded that since the 1989 Edition of ASME Boiler and Pressure Vessel Code, Section XI has been approved in 10 CFR 50.55a, the licensee's proposed use of the 1989 Code Edition for IIR-40, is approved pursuant to 10 CFR 50.55a(g)(4)(iv), provided that all related requirements of the respective edition and addenda are met.

Attachment: Technical Letter Report

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Date: October 5, 1995

TECHNICAL LETTER REPORT ON THE
FIRST TEN-YEAR INTERVAL INSERVICE INSPECTION
REQUESTS FOR RELIEF IIR-40 THROUGH IIR-44
FOR
WOLF CREEK NUCLEAR OPERATING CORPORATION
WOLF CREEK GENERATING STATION
DOCKET NUMBER 50-482

1.0 INTRODUCTION

In a letter dated March 28, 1995, the licensee, Wolf Creek Nuclear Operating Corporation, submitted Requests for Relief IIR-40 through IIR-44. These requests for relief are applicable for the first 10-year inservice inspection (ISI) interval at Wolf Creek Nuclear Generating Station. The Idaho National Engineering Laboratory (INEL) staff has evaluated the subject requests for relief in the following section.

2.0 EVALUATION

The Code of record for Wolf Creek Nuclear Generating Station's first 10-year ISI interval is the 1980 Edition through Winter 1981 Addenda (80W81) of the American Society of Mechanical Engineers (ASME) Code Section XI, except that the extent of examination for Code Class 2 piping welds has been determined by the 1974 Edition through Summer 1975 Addenda (74S75) as permitted by 10 CFR 50.55a(b). The information provided by the licensee in support of these requests for relief has been evaluated and the bases for disposition are documented below.

A. Request for Relief IIR-40: Examination Category B-M-2, Item B12.50, Visual Examination of Valve Internals

Code Requirement: Table IWS-2500-1, Examination Category B-M-2, Item B12.50 requires a VT-3 visual examination of the internal surfaces of one valve of each group of valves of that are of the same size, construction design, and manufacturing method, and that perform similar functions in the system, during each inspection interval.

Licensee's Code Relief Request: Relief is requested from the Code-required VT-3 visual examination of the internal surfaces of the following valves during the first 10-year inspection interval:

<u>Valve No.</u>	<u>Valve Identification</u>
EJ-04-BB-PV8702A(B)-SURF	Reactor Coolant System to Residual Heat Removal Pump Suction Isolation
EJ-04-HV-8701A(B)-SURF	Reactor Coolant System to Residual Heat Removal Pump Suction Isolation
BB-02-8010A(B&C)-SURF	Pressurizer Safety

Licensee's Basis for Requesting Relief (as stated):

"Because these examinations must be performed whether or not the valves have to be disassembled for maintenance, this requirement is considered impractical.

"The requirement to disassemble primary system valves for the sole purpose of performing a VT-3 of the internal pressure boundary surfaces has only a very small potential of increasing plant safety margins and a very disproportionate impact on expenditures of plant manpower and radiation exposure, which has been conservatively estimated to be approximately 30 Man-Rem.

"A more practical approach which would provide an equivalent sampling program and significantly reduced radiation exposure to plant personnel is to examine the internal pressure boundary of only those valves that require disassembly for maintenance purposes. This approach is supported by ASME Section XI, 1989 Edition, which is approved for use in 10 CFR 50.55a."

Licensee's Proposed Alternative (as stated):

"VT-3 of the internal pressure boundary surfaces will be performed, to the extent practical, when a valve is disassembled for maintenance purposes."

Evaluation: The Code of record (80W81) at Wolf Creek requires a VT-3 visual examination of valve body internal surfaces. Disassembly of a valve to gain access for examination requires a significant amount of manpower, time, and radiation exposure. As a result, later editions of the Code were modified to eliminate the impracticality of disassembling a valve for the sole purpose of performing the VT-3 visual examination. In the 1989 Edition of Section XI, the visual examination is required only when a valve is disassembled for maintenance, repair, or other inspection. The licensee's proposed alternative is equivalent to the requirements of Examination Category B-M-2, Item B12.50, of the 1989 Edition of the Code. Since this Code edition has been approved for general use by incorporation into the regulations, it is considered an acceptable alternative to the requirements of the Code of record. Therefore, the INEL staff recommends that use of the requirements of Examination Category B-M-2, Item B12.20, of the 1989 Code be approved,

pursuant to 10 CFR 50.55a(g)(4)(iv), provided that all associated requirements of the 1989 Code are also met.

B. Request for Relief IIR-41: Examination Category C-C, Item C3.20, Class 2 Piping Integrally Welded Attachments

Code Requirement: Table IWC-2500-1, Examination Category C-C, Item C3.20 requires a 100% surface examination of selected Class 2 integrally welded attachments.

Licensee's Code Relief Request: Relief is requested from the Code-required surface examination of integrally welded Attachment EP-02-R020.

Licensee's Basis for Requesting Relief (as stated):

"Surface examination of 4 out of 8 lugs were obstructed by a pipe support located adjacent to the lugs. The obstructed weld length was approximately 5 inches (29.4 percent of the 17 inches total weld length) for each lug.

"The obstructing support and subject lugs are located inside the bioshield of the Reactor Containment Building at a high elevation. Because of this support's location and size, its removal would require an extensive work effort and exposure to personnel without a compensating increase in safety."

Licensee's Proposed Alternative (as stated):

"None. The required surface examination was completed to the maximum extent possible without undue burden of support removal."

Evaluation: The Code requires a 100% surface examination of the subject Class 2 integrally welded attachment, EP-02-R020. However, this welded attachment could not receive the complete Code-required examination because of inaccessibility due to a component support. Therefore, the subject integrally welded attachment examination is impractical to perform to the extent required by the Code. To meet the Code requirements, the component support would have to be redesigned and replaced; imposition of the requirements would cause a considerable burden on the licensee.

Since a significant portion (85%) of the eight lugs associated with the subject integrally welded attachment was examined, it is reasonable to conclude that a pattern of degradation, if present, would have been detected. Therefore, reasonable assurance of operational readiness has been maintained by the examinations that were performed and, considering the impracticality of meeting the Code requirements, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

C. Request for Relief IIR-42: Examination Category C-F, Item C5.21, Class 2 Piping Longitudinal Welds >1/2-inch Wall Thickness

Code Requirement: Table IWC-2500-1, Examination Category C-F, Item C5.21 requires 100% surface and volumetric examination of Class 2 piping longitudinal welds that intersect circumferential welds selected for examination for a minimum length of 2.5 times the pipe thickness.

Licensee's Code Relief Request: Relief is requested from the Code-required volumetric examination of 10-inch pipe longitudinal Weld EJ-02-S035-D-LU in Residual Heat Removal Train B.

Licensee's Basis for Requesting Relief (as stated):

"Complete ultrasonic examination of the weld length is obstructed by a small pipe clamp adjacent to the end of the weld. Obstruction by the support results in 50% of the weld volume not receiving two beam path coverage for the parallel scan.

"Removal of this support would require weld removal with subsequent repair. The subject weld and pipe support are located on the Residual Heat Removal System which contains a radioactive fluid. Therefore, removing this support would result in dose exposure to personnel and an extensive work effort without a compensating increase in safety."

Licensee's Proposed Alternative (as stated):

"None. The required volumetric examination was completed to the maximum extent possible without undue burden of support removal."

Evaluation: The Code requires volumetric examination of longitudinal Weld EJ-02-S035-D-LU for a minimum length of 2.5 times the pipe thickness. However, this weld was only partially examined as the result of interference due to a component support that makes examination of this weld impractical to perform to the extent required by the Code. To meet the Code requirements, the component support would have to be redesigned and replaced; imposition of the requirements would cause a considerable burden on the licensee.

A total of 50% of the weld volume was examined, and a complete surface exam was performed. In addition, other Item C5.21 welds are being completely examined. It is reasonable to conclude that a pattern of degradation, if present, would have been detected. Therefore, reasonable assurance of operational readiness has been maintained by the examinations that were performed and, considering the impracticality of meeting the Code requirements, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

D. Request for Relief IIR-43, Examination Category B-J, Item B9.31, Class 1 Branch Connection Piping Welds >4-inch.

Code Requirement: Examination Category B-J, Item B9.31 requires 100% surface and volumetric examination of the branch connection piping welds greater than or equal to 4 inches as defined by Figure IWB-2500-9, -10 or -11 as applicable.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required volumetric examination on the following branch connection piping welds:

<u>Weld No.</u>	<u>Weld Identification</u>
BB-01-S101-7	Reactor Coolant System Loop 1 Cold Leg, 10" Nozzle-to-27.5" ID pipe
BB-01-S302-3	Reactor Coolant System Loop 3 Hot Leg, 6" Nozzle to 29" ID Pipe
BB-01-S402-3	Reactor Coolant System Loop 4 Hot Leg, 14" Nozzle to 29" ID Pipe

Licensee's Basis for Requesting Relief (as stated):

"Volumetric examination of these welds was limited to being examined from the pipe side only because of the component geometry (pipe branch nozzle configuration) and metallurgic properties (centrifugally cast stainless steel). Because of the coarse grain material and high attenuative nature of the materials, it is necessary to use a refracted longitudinal sound wave to achieve the best ultrasonic response. This type of wave cannot be extended to provide two beam path direction coverage.

"Strict ASME Section III quality controls were used when designing, fabricating, and installing this weld. This weld was ultrasonically inspected to the fullest extent possible, including examination of 100% of the volume in two beam path directions for reflectors transverse to the weld seam, with no irregularities identified. This fact, in conjunction with the surface examination results and Reactor Coolant System visual examinations (VT-2) following each refueling outage, provides confidence that the weld is structurally sound and that the limited exam does not compromise the health and safety of the public."

Licensee's Proposed Alternative Examination (as stated):

"None. The required volumetric examination was completed to the maximum extent practical due to geometry and material attenuation variables."

Evaluation: The Code requires a surface and a volumetric examination of the subject Class 1 branch connection piping welds. However, the nozzles are centrifugally cast stainless steel that results in a coarse

grain material causing high ultrasonic attenuation, which, along with their complex geometry, restricts volumetric examination of the nozzle-to-pipe weld from the nozzle side. The nozzle-to-pipe design, therefore, makes the Code-required examination impractical to perform. To examine 100% of the welds in accordance with Code requirements, replacement of the nozzles with a design favorable to ultrasonic examinations would be required. Imposition of this requirement would cause a considerable burden on the licensee.

A total of 75% of each weld was examined, and a complete surface exam was performed. Since significant portions of these welds were examined, it is reasonable to conclude that a pattern of degradation, if present, would have been detected. Therefore, reasonable assurance of operational readiness has been maintained and, considering the impracticality of meeting the Code requirements, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

E. Request for Relief IIR-44: Examination Category C-F, Item C5.21 Class 2 Piping Circumferential Welds

Code Requirement: Table IWC-2500-1, Examination Category C-F, Item C5.21 requires 100% surface and an inner one-third volumetric examination of selected Class 2 piping circumferential welds.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required volumetric examination on Chemical and Volume Control System charging line circumferential Welds BG-01-FW313, BG-01-FW321, BG-01-F026, and BG-01-FW313.

Licensee's Basis for Requesting Relief (as stated):

"Complete ultrasonic examination of the weld was not feasible because of limitations in geometry and metallurgic properties. Geometric limitations resulted from weld shrinkage at the toe of the weld which causes loss of search unit contact due to lift off. To perform a complete volumetric examination would require design modifications of the geometry to allow access for the ultrasonic examination.

"Approximately 36.6% of the weld required volume was not examined in two perpendicular directions with approximately 7.6% of that volume not examined in either perpendicular direction."

Licensee's Proposed Alternative (as stated):

"None. The required volumetric examination was completed to the maximum extent possible due to geometry and material attenuation variables."

Evaluation: The Code requires surface and volumetric examination of the subject Chemical and Volume Control System welds. The licensee states that volumetric examination is limited due to geometric limitations resulting from weld shrinkage at the toe of the weld. This shrinkage

causes loss of search unit contact due to lift off. However, this area can be examined using extended beam paths.

A total of 63% of the subject welds was examined from two directions, with 93% examined from one direction only. In addition, a complete surface exam was performed. These four welds are a small percentage of the C-F welds. Since significant portions of the subject welds are being examined, along with other Item C5.21 welds that are being completely examined, it is reasonable to conclude that a pattern of degradation, if present, would have been detected. Furthermore, requiring the licensee to shut down the reactor to perform a complete examination of the four subject welds would be a hardship without a compensating increase in safety. Reasonable assurance of piping integrity has been maintained by the examinations that were performed; therefore, it is recommended that the proposed alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

3.0 CONCLUSION

Based on the above evaluations, the INEL staff concludes that the Code requirements addressed in Requests for Relief IIR-41, IIR-42, and IIR-43 are impractical for Wolf Creek. In the subject cases, the licensee's examinations should provide reasonable assurance of continued structural integrity. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

It is concluded that for Request for Relief IIR-44, the licensee has demonstrated that specific Section XI requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. In this case, it is recommended that the proposed alternative be authorized, pursuant to 10 CFR 50.55a(a)(3)(ii).

It is recommended that the licensee's use of a subsequent edition and addenda of ASME Section XI, as proposed in Request for Relief IIR-40, be approved pursuant to 10 CFR 50.55a(g)(4)(iv), provided that all related requirements of the respective edition or addenda are met.