



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
OF THE SECOND YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN, REVISION 5
AND ASSOCIATED REQUESTS FOR RELIEF
FOR
VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION, UNIT 1
DOCKET NUMBER: 50-338

1.0 INTRODUCTION

The Technical Specifications for North Anna Power Station, Unit 1 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).

10 CFR 50.55a(a)(3) 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 ten-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 North Anna Power Station, Unit 1 second 10-year inservice inspection (ISI) interval is the 1983 Edition through Summer 1983 Addenda. 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 June 5, 1995, Virginia Electric and Power Company submitted to the NRC its Second Ten-Year Interval Inservice Inspection Program Plan, Revision 5 and associated requests for relief for North Anna Power Station, Unit 1.

2.0 EVALUATION AND CONCLUSIONS

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 Second Ten-Year Interval Inservice Inspection Program Plan, Revision 5 and associated requests for relief for North Anna Generating Station, Unit 1.

Based on the information submitted, the staff adopts the contractor's conclusions and recommendations presented in the Technical Letter Report attached. The staff has concluded that no deviations from regulatory requirements or commitments were identified for Revision 5 to the *North Anna Power Station, Unit 1, Second Ten-Year Interval Inservice Inspection Program Plan*.

In addition, the staff has concluded that for Requests for Relief NDE-21, NDE-22, NDE-23, NDE-24, and NDE-26, the examinations required by the Code are impractical and that the licensees's proposed alternatives to Code requirements will provide reasonable assurance of operational readiness. The staff has determined that 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, as described in the attached Technical Letter Report, that could result if the requirements were imposed on the facility. Therefore, relief is granted pursuant to 10 CFR 50.55a(g)(6)(i) as requested.

TECHNICAL EVALUATION LETTER REPORT
ON THE SECOND TEN-YEAR INTERVAL INSERVICE INSPECTION
PROGRAM PLAN, REVISION 5
FOR
VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION, UNIT 1
DOCKET NUMBER: 50-338

1.0 INTRODUCTION

By letter dated June 5, 1995, the licensee, Virginia Electric and Power Company, submitted Revision 5 to the *North Anna Power Station, Unit 1, Second Ten-Year Interval Inservice Inspection Program Plan*. Revision 5 documents changes to the inservice inspection (ISI) program and includes five new requests for relief from the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI. The Idaho National Engineering Laboratory (INEL) staff has reviewed the changes and evaluated the information provided by the licensee in support of these requests for relief in the following section.

2.0 EVALUATION

The information provided by the licensee in Revision 5 to the ISI Program Plan has been evaluated. North Anna Power Station, Unit 1, began the second 10-year ISI interval December 24, 1988. Based on this date, the applicable edition of Section XI of the ASME Code for the second 10-year interval is the 1983 Edition through Summer 1983 Addenda. The information provided by the licensee for this revision and information in support of proposed alternatives to Code requirements has been evaluated and the bases for disposition are documented below.

- A. Code Cases: Section 1.1.4.9 of the Program Plan lists the ASME Section XI Code Cases that have been incorporated into the ISI Program for the second interval. Revision 5 adds Code Case N-356, *Certification Period of Level III NDE Personnel*, and Code Case N-524, *Alternative Examination Requirements for Longitudinal Welds in Class 1 and 2 Piping* to that list. Code Case N-356 is referenced in NRC Regulatory Guide 1.147, *Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1*, Revision 11, and is, therefore, acceptable for general use. Use of Code Case N-524 was previously approved for use by Virginia

Electric and Power Company in a NRC Safety Evaluation dated October 3, 1994.

B. Request for Relief NDE-21, Examination Category B-K-1, Item B10.10, Class 1 Piping Integrally Welded Attachments

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-K-1, Item B10.10, requires volumetric or surface examination of integrally welded attachments as defined by Figures IWB-2500-13, -14, and -15, as applicable.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required surface examination of integral attachment Weld 46H, Line 6"-SI-132-1502-Q1.

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

"The component listed above has been examined to the extent practical as required by the Code. Due to interferences from a pipe clamp, the reduction in coverage of the surface examination was 12.5%. Figure NDE-21-1¹ is provided detailing the limitations experienced. Tube steel, above and below the pipe clamp, obstructs the removal of the pipe clamp. Alternative components could not be substituted for examination due to the mandatory selection requirements of the Code."

Licensee's Proposed Alternative Examination (as stated):

"It is proposed that the examinations already completed at the reduced coverage be counted as meeting the Code requirements."

Evaluation: The Code requires that the subject piping integral attachment weld receive 100% surface examination. Based on the review of the licensee's sketch depicting the examination area and interference, it has been determined that the Code-required surface examination is impractical. To obtain complete surface coverage, design modifications would be required that would cause a considerable burden on the licensee.

The licensee proposes to perform the surface examination to the extent

¹Not included with this evaluation.

practical, resulting in 87.5% coverage. Based on the significant percent of coverage obtained, it can be concluded that a pattern of degradation, if present, would have been detected. As a result, reasonable assurance of operational readiness has been provided. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

C. Request for Relief NDE-22, Examination Category B-J, Item B9.11, Class 1 Piping Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-J, Item B9.11, requires volumetric and surface examinations of Class 1 piping circumferential welds as defined by Figure IWB-2500-8.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required volumetric examination of Weld 8, Line 31"-RC-2-2501-Q1, and Weld 20, Line 31"-RC-5-2501-Q1.

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

"The component listed above has been examined to the extent practical as required by the Code. Due to interferences caused by an insulation ring welded to the pump and weld joint geometry, the reduction in coverage of the volumetric examination was greater than 10%. Table NDE-22-1 is provided detailing the limitations experienced. Amplifying sketch, Figure NDE-22-1 is also provided.² Alternative components could not be substituted for examination due to the mandatory selection requirements of the Code."

Licensee's Proposed Alternative Examination (as stated):

"It is proposed that the examinations already completed at the reduced coverage be counted as meeting the Code requirements."

Evaluation: The Code requires that the subject piping welds receive 100% volumetric and surface examinations. Based on the review of the information provided in the table and the sketch depicting the examination area and interference, it has been determined that the Code-required volumetric examination is impractical because of the joint

²Table and Figure are not included with this evaluation.

configuration and the material properties of the scanning area. (The elbow material is ASTM A-351 austenitic steel. This highly attenuative material is not conducive to extended V-path examination.) To obtain complete volumetric coverage, modifications providing for complete examination would be required, causing a considerable burden on the licensee.

The licensee proposes to perform the volumetric examination to the extent practical, resulting in 100% one-directional volumetric coverage and 100% surface examination coverage. Based on the percent of coverage obtained, it can be concluded that a pattern of degradation, if present, would have been detected. As a result, reasonable assurance of operational readiness has been provided. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

D. Request for Relief NDE-23, Examination Category B-J, Item B9.31, Class 1 Branch Connection Welds Nominal 4 Inches and Larger

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-J, Item B9.31, requires volumetric and surface examinations of branch connection welds as defined by Figure IWB-2500-9, -10, and -11, as applicable.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required volumetric examination of branch connection Weld SW-31, Line 29"-RC-7-2501-Q1.

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

"The component listed above has been examined to the extent practical as required by the Code. Due to the weld joint geometry, the reduction in coverage of the volumetric examination was greater than 10%. Table NDE-23-1 is provided detailing the limitations experienced. Amplifying sketch, Figure NDE-23-1 is also provided.³ Alternative components could not be substituted for examination due to the mandatory selection requirements of the Code."

³Table and Figure are not included with this evaluation.

Licensee's Proposed Alternative Examination (as stated):

"It is proposed that the examinations already completed at the reduced coverage be counted as meeting the Code requirements."

Evaluation: The Code requires that the subject branch connection weld receive 100% volumetric and surface examinations. Based on the review of the information provided in the table and the sketch depicting the examination area and interference, it was determined that the joint configuration makes the Code-required volumetric examination impractical. To obtain complete volumetric coverage, modifications would be required that would cause a considerable burden on the licensee.

The licensee proposes to perform the volumetric examination to the extent practical, resulting in 100% one-directional volumetric coverage and 100% surface examination coverage. Based on the percent of coverage obtained, it can be concluded that a pattern of degradation, if present, would have been detected. As a result, reasonable assurance of operational readiness has been provided. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

E. Request for Relief NDE-24, Examination Category B-J, Item B9.31, Class 1 Branch Connection Welds Nominal 4 Inches and Larger

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-J, Item B9.31, requires volumetric and surface examinations of branch connection welds as defined by Figure IWB-2500-9, -10, and -11, as applicable.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required volumetric examination of branch connection Weld SW-42, Line 27.5"-RC-9-2501-Q1.

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

"The component listed above has been examined to the extent practical as required by the Code. Due to the weld joint geometry the reduction in coverage of the volumetric examination was greater than 10%. Table NDE-24-1 is provided detailing the limitations experienced. Amplifying

sketch, Figure NDE-24-1 is also provided.⁴ Alternative components could not be substituted for examination due to the mandatory selection requirements of the Code."

Licensee's Proposed Alternative Examination (as stated):

"It is proposed that the examinations already completed at the reduced coverage be counted as meeting the Code requirements."

Evaluation: The Code requires that the subject branch connection weld receive 100% volumetric and surface examinations. Based on the review of the information provided in the table and the sketch depicting the examination area and interference, it was determined that, because of the joint configuration, the Code-required volumetric examination is impractical. To obtain complete volumetric coverage, design modifications providing for complete examination would be required, which would cause a considerable burden on the licensee.

The licensee proposes to perform the volumetric examination to the extent practical, resulting in 52% coverage in one direction and 25% coverage in the other direction. Complete surface examination coverage was obtained. Based on the percent of examination coverage obtained, it can be concluded that a pattern of degradation, if present, would have been detected. As a result, reasonable assurance of operational readiness has been provided. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

F. Request for Relief NDE-26, Examination Category B-F, Item B5.70, Class 1 Piping Welds and Safe End Welds

Code Requirement: Section XI, Table IWB-2500-1, Examination Category B-F, Item B5.70, requires volumetric and surface examination of Steam Generator nozzle-to-safe end welds as defined by Figure IWB-2500-8.

⁴Table and Figure are not included with this evaluation.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required volumetric examinations of the welds listed below.

Table 1	
Weld/Component	Description
*4A	29"-RC-1-2501-Q1
N-SE29IN	29"-RC-1-2501-Q1
*5A	31"-RC-2-2501-Q1
N-SE-31IN	31"-RC-2-2501-Q1
*16A	29"-RC-4-2501-Q1
N-SE-29IN	29"-RC-1-2501-Q1
*17A	31"-RC-5-2501-Q1
N-SE31IN	31"-RC-5-2501-Q1
*28A	29"-RC-7-2501-Q1
N-SE-29IN	29"-RC-1-2501-Q1
*29A	31"-RC-8-2501-Q1
N-SE31IN	31"-RC-8-2501-Q1

* Previously Evaluated as part of NDE-20

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

"The components listed above have been examined to the extent practical as required by the Code. Longitudinal waves were used to perform the examination because of the materials involved (cast stainless steel and inconel). However, the use of longitudinal waves prevents the use of beam extension to increase examination volume. Due to interferences of other components or weld joint geometry the reduction in coverage for the listed components was greater than 10%. Table NDE-26-1 is provided detailing the limitations experienced. Amplifying sketches are also provided.⁵ Alternative components could not be substituted for examination due to the mandatory selection requirements of the Code.

⁵Table and Figure are not included with this evaluation.

Licensee's Proposed Alternative Examination (as stated):

"It is proposed that the examinations already completed at the reduced coverage be counted as meeting the Code requirements."

Evaluation: The Code requires that the subject piping nozzle-to-safe end welds receive 100% volumetric and surface examinations. The licensee stated that the Code-required surface examinations were performed. Based on the review of the sketches of the subject examination areas, it has been determined that complete volumetric examination is impractical because of the nozzle-to-safe end configurations and the attenuative properties of the safe-ends due to their large grain size. To obtain complete volumetric coverage, design modifications or replacement of the nozzle-to-safe ends with those of a design providing for complete examination would be required. Imposition of this requirement would cause a considerable burden on the licensee.

The licensee proposes to perform the volumetric examinations to the extent practical, resulting in greater than 90% volumetric coverages from at least one side. Based on the percent of coverage that can be obtained, combined with the Code-required surface examination, it can be concluded that significant degradation, if present, would have been detected. As a result, reasonable assurance of operational readiness will be provided. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

3.0 CONCLUSION

The INEL staff has reviewed Revision 5 to the *North Anna Power Station, Unit 1, Second Ten-Year Interval Inservice Inspection Program Plan*. For Requests for Relief NDE-21, NDE-22, NDE-23, NDE-24, and NDE-26, it has been determined that examination to the extent required by the Code is impractical and that the licensees's proposed alternatives to Code requirements will provide reasonable assurance of operational readiness. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i).

Based on review of Revision 5 to the ISI program plan, no deviations from regulatory requirements or commitments were identified.