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

TECHNICAL LETTER REPORT ON THE SECOND TEN-YEAR INTERVAL INSERVICE INSPECTION REQUEST FOR RELIEF NDE-22 FOR VIRGINIA ELECTRIC AND POWER COMPANY NORTH ANNA POWER STATION, UNIT 2 DOCKET NUMBER: 50-339

1.0 INTRODUCTION

In a letter dated April 3, 1995, the licensee, Virginia Electric and Power Company, submitted Request for Relief NDE-22. This request is applicable to the second 10-year inservice inspection (ISI) interval, which began December 1990 for North Anna Power Station, Unit 2. The Idaho National Engineering Laboratory (INEL) staff has evaluated the subject request for relief in the following section.

2.0 EVALUATION

The Code of record for the North Anna Power Station, Unit 2, second 10-year ISI interval is the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, 1986 Edition. The information provided by the licensee in support of the request for relief has been evaluated and the basis for disposition is documented below.

Request for Relief NDE-22: Examination Category B-F, Item B5.70, Steam Generator Dissimilar Metal Nozzle-to-Safe End Butt Welds

Code Requirement: Examination Category B-F, Item B5.70 requires 100% volumetric and surface examinations of steam generator dissimilar metal nozzle-to-safe end welds as defined by Figure IWB-2500-8.

Licensee's Code Relief Request: The licensee requested relief from performing 100% of the Code-required volumetric examinations of the following nozzle-to-safe end welds:

Weld ID	Drawing #
N-SE31IN	12050-WMKS-RC-E-1A.2P
N-SE29IN	12050-WMKS-RC-E-1A.2P
N-SE31IN	12050-WMKS-RC-E-1B.2P
N-SE29IN	12050-WMKS-RC-E-1B.2P

N-SE31IN	12050-WMKS-RC-E-1C.2P
N-SE29IN	12050-WMKS-RC-E-1C.2P

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

"Pursuant to 10 CFR 50.55a(g)5(iii), relief is requested from certain requirements of the ASME Section XI Code associated with the extent of examinations practical for the upcoming North Anna Unit 2 steam generator replacement. North Anna Unit 2 is currently in the second period of the second ten-year interval. The North Anna Unit 2 inservice inspection program is conducted in accordance with the 1986 Edition of ASME Section XI.

"The Category B-F welds listed above are the nozzle-to-safe end welds on the replacement steam generators for North Anna Unit 2. The extent of examination for the axial scans from the nozzle side of the weld was limited as depicted on Figure NDE-22-1[a]. The limitation was caused by the nozzle outside radius which restricts movement of the transducer on the nozzle side of the weld. The Category B-F welds listed above were examined with focused dual element longitudinal wave transducers. The use of focused longitudinal waves was necessary because the weld joint is carbon/inconel/stainless design. The size of the search unit that can be used is dictated by focal length and frequency required to examine the particular weld thickness. The smallest practical size search unit possible was used to conduct the above examinations. As shown by Figure NDE-22-1, 100% of the required volume was examined in the axial direction from the safe end side of the weld and in both circumferential directions. It is not possible to extend the beam path to examine the weld in two directions from one side of the weld due to the necessity to use focused longitudinal waves to obtain a meaningful examination of the welds. No other supplemental ultrasonic means of examination is practical to examine additional weld volume for the Category B-F welds listed above."

Licensee's Proposed Alternative (as stated):

"It is proposed that the Category B-F examinations already completed at the reduced coverage be counted as meeting the Code requirements for preservice inspections as well as future inservice inspections."

Evaluation: The Code requires 100% volumetric preservice examination of the subject nozzle-to-safe end welds as part of the Unit 2 steam generator replacement. The same volumetric examination is required by the Code for future inservice examinations. The licensee proposed a best-effort volumetric examination for preservice and inservice examinations because access is limited from the nozzle side. Based on review of Figure NDE-22-1, it is clear that the nozzle outside radius

---

a. Not included in this report.

restricts movement of the transducer on the nozzle side of the weld. It is not possible to extend the beam path to examine the weld in two directions from one side with the focused longitudinal waves needed to perform a meaningful examination of the carbon/inconel/stainless welds. To meet the Code requirements, the subject nozzles would require major design modification. Imposition of the requirements would cause a considerable hardship without a compensating increase in safety.

Approximately 75% of the Code-required volume was examined for each weld. Since a significant portion of the nozzle-to-safe end welds was volumetrically examined, a pattern of degradation, if present, would have been detected. Reasonable assurance of operational readiness has been maintained by the examinations that were performed and, considering the hardship without compensating increase in safety that would result from meeting the Code requirements, it is recommended that the licensee's proposed alternative be authorized for the preservice examinations only, pursuant to 10 CFR 50.55a(a)(3)(ii). Due to changes in technologies and techniques, it may become possible to examine 100% of these welds in the future. Therefore, relief should not be granted for inservice examinations until such time as it is required.

3.0 CONCLUSION

The INEL staff concludes that performing 100% of the Code-required ultrasonic examination of the subject nozzle-to-safe end welds would result in a hardship without a compensating increase in safety, and that examining these welds to the extent practical will provide reasonable assurance of operational readiness. Therefore, it is recommended that the licensee's proposed alternative be authorized for the preservice examinations only, pursuant to 10 CFR 50.55a(a)(3)(ii). Due to changes in technologies and techniques, it may become possible to examine 100% of these welds in the future. Therefore, relief should not be granted for subsequent inservice examinations until such time as it is required.