ENCLOSURE 1

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
OF THE SECOND TEN YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN
REVISED REQUEST FOR RELIEF NO. NDE-18
FOR
VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION, UNITS 1 AND 2
DOCKET NUMBERS: 50-338 AND 50-339

1.0 INTRODUCTION

The Technical Specifications for North Anna Power Station, Units 1 and 2 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, Units 1 and 2 second 10-year inservice inspection (ISI) interval is the 1983 Edition through Summer 1983 Addenda (Unit 1), and 1986 Edition (Unit 2) respectively. 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 February 7, 1996, Virginia Electric and Power Company submitted to the NRC its Second Ten-Year Interval Inservice Inspection Program Plan Revised Request for Relief No. NDE-18 for the North Anna Power Station, Units 1 and 2.

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 Revised Request for Relief No. NDE-18 for the North Anna Power Station, Units 1 and 2.

Based on the information submitted, the staff adopts the contractor's conclusions and recommendations presented in the Technical Letter Report. In its letter dated February 7, 1996, Virginia Electric and Power Company revised Relief Request NDE-18 that was originally granted conditionally in Safety Evaluation Reports (SERs) issued on August 7, 1995, for Unit 1 and August 8, 1995, for Unit 2. This relief request was revised to add terminal end piping welds that are associated with the regenerative heat exchangers.

The staff has reviewed the licensee's revised Relief Request NDE-18 and concluded that the Code-required surface examination of the subject regenerative heat exchanger terminal end piping welds would result in a hardship without a compensating increase in quality or safety at the North Anna Nuclear Plant, Units 1 and 2. In addition, the staff concluded that the licensee's proposed alternative provides reasonable assurance of operational readiness of the regenerative heat exchangers. Therefore, the licensee's proposed alternative, to examine the terminal end welds on the lower regenerative heat exchanger sub-vessels, is authorized pursuant to 10 CFR 50.55a(a)(3)(ii).

For the other components of the regenerative heat exchanger contained in the orignal Request for Relief No. NDE-18, the previous conditional granting of relief pursuant to 10 CFR 50.55a(g)(6)(i) in NRC Safety Evaluations dated August 7, 1995, and August 8, 1995, remain in effect for the current interval.

ENCLOSURE 2

TECHNICAL LETTER REPORT
SECOND 10-YEAR INSERVICE INSPECTION INTERVAL
REVISED RELIEF REQUEST NDE-18
VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION, UNITS 1 AND 2
DOCKET NUMBERS 50-338 AND 50-339

1.0 INTRODUCTION

In a letter dated February 7, 1996, Virginia Electric and Power Company submitted revised Relief Request NDE-18 for the second 10-year inservice inspection (ISI) interval at the North Anna Power Station, Units 1 and 2. The original Relief Request NDE-18, on the regenerative heat exchangers, was granted conditionally in Safety Evaluation Reports (SERs) issued on August 7, 1995, for Unit 1 and August 8, 1995, for Unit 2. This relief request was revised to add terminal end piping welds that are associated with the regenerative heat exchangers. The Idaho National Engineering Laboratory (INEL) staff has evaluated the revised relief request in the following section.

2.0 EVALUATION

The Codes of record for the North Anna Power Station, Units 1 and 2, second 10-year ISI interval are the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI, 1983 Edition, Summer 1983 Addendum and 1986 Edition, respectively. The information provided by the licensee in support of the revised relief request has been evaluated and the basis for disposition is documented below.

Revised Relief Request NDE-18, Examination Category B-J, Item B9.21, Terminal End Circumferential Piping Welds

Code Requirement: Table IWB-2500-1, Examination Category B-J, Item B9.21, requires 100% surface examination of piping welds, as defined in Figure IWB-2500-8, of piping less than NPS 4.

Licensee's Code Relief Request: The licensee requested relief from performing the Code-required 100% surface examination of regenerative heat exchanger terminal end circumferential piping Welds 19, 20, 21, and 32 for Unit 1 and Welds 19, 20 , 21, and 1A for Unit 2.

Licensee's Basis for Relief (as stated):

"This relief request was originally submitted by letter Serial No. 93-018, dated February 16, 1993. The relief was granted ("provided that the lower regenerative heat exchanger receives the Code-required examinations to the extent possible") by letter dated August 7, 1995, and its associated safety evaluation report. This request is being revised to add four of six terminal end piping-to-vessel welds which are required to be selected for examination under Category B-J note 1(a) under item B9.21. These welds were omitted from the original request and need to be addressed in the relief request in addition to those already evaluated. New survey maps of the regenerative heat exchanger indicate higher dose rates than previously estimated (survey attached*). Performing these surface examinations would result in approximately 10.5 man-rem of exposure and would negate, to a large degree, the exposure reduction of the original relief request. This is due to the close proximity of the regenerative heat exchanger to these welds and the need for scaffolding and insulation removal, which were previously eliminated for the regenerative heat exchanger in our original request."

Licensee's Proposed Alternative (As stated):

"Technical Specifications require that the RCS Leak Rate be limited to 1 gallon per minute unidentified leakage. This value is calculated every 72 hours in accordance with Technical Specification requirements. Additionally, the containment atmosphere particulate radioactivity is monitored every 12 hours per Technical Specification requirements. As a result, new leakage is rapidly identified and located during operation. Leakage identified from these components can be easily isolated by two upstream valves within the control room. The valves also receive an automatic control signal to close on inventory loss based on the pressurizer level. However, these valves could not be used as the Class 1 boundary valves due to the their nonsafety-related actuation. Correspondingly, as a result of the reclassification to Class 1, these components will receive a system leakage test prior to start up after each refueling outage. During this system leakage test the components will receive a visual (VT-2) examination. The support structures will receive a visual (VT-3) examination to the extent required by the Code without insulation removal.

---

*Not included with this evaluation.

"Your evaluation of our original relief request dated August 7, 1995, added alternative requirements. The appropriate portion of the Technical Evaluation Report states:

> "The licensee stated that previous partial examinations have been completed on these welds. Consequently, it is concluded that a best-effort volumetric examination of the lower RHX, in addition to system radiation monitoring and the Code-required visual examinations, would provide reasonable assurance of the system's inservice structural integrity. Therefore, it is recommended that relief be granted pursuant to 10 CFR 50.55a(g)(6)(i), provided the lower RHX vessel receives Code-required volumetric examinations to the extent possible.

"We also request that this philosophy of inspection be extended to the vessel-to-piping terminal ends on the regenerative heat exchanger (RHX). The two lower RHX vessel-to-piping terminal ends welds (22 & 21A*) (22 & 46**) will be examined by the surface method as required by the Code."

Evaluation: The Code requires surface examination of the subject regenerative heat exchanger (RHX) piping terminal end welds. The licensee's basis for requesting relief is ALARA considerations. The licensee's radiation dose estimate for surface examination of these terminal end piping welds is 10.5 man-rem. This high radiation exposure would result in a considerable hardship for the licensee.

The licensee proposes to monitor the reactor coolant system leakage rate and the containment atmosphere particulate radioactivity, as required by the Technical Specifications, to identify and locate leakage. Any leakage from these joints can be isolated by valves from within the control room. In addition, these welds will receive a VT-2 visual examination during the system leakage test prior to start-up and after each refueling outage. The associated supports will receive a VT-3 visual examination to the extent required by the Code (without insulation removed).

---

*For Unit 1

**For Unit 2

Each RHX is made up of three sub-vessels that are connected in series. Each sub-vessel has two terminal end piping welds associated with it. The licensee has proposed to examine the two piping terminal end welds associated with the RHX lower sub-vessel. The lower sub-vessel operates at the highest temperature of the three and is considered the most highly stressed.

It is concluded that: (1) examination of the two piping terminal end welds on the lower RHX sub-vessel in place of the six required terminal end welds, in addition to the system radiation monitoring and the Code-required visual examinations, will provide reasonable assurance of structural integrity, and (2) performance of the Code-required surface examination of all of the subject terminal ends would result in a hardship without a compensating increase in the level of quality or safety. Therefore, it is recommended that the licensee's alternative be authorized pursuant to 10 CFR 50.55a(a)(3)(ii) for the four terminal end welds for each unit. For the other components in Relief Request NDE-18, it is recommended that the previous conditional granting of relief pursuant to 10 CFR 50.55a(g)(6)(i) in the August 7, 1995, and August 8, 1995, SERs remain in effect.

3.0 CONCLUSION

The INEL staff has reviewed the licensee's revised Relief Request NDE-18 and determined that the Code-required surface examination of all of the subject regenerative heat exchanger terminal end piping welds would result in a hardship without a compensating increase in quality or safety at the North Anna Nuclear Plant, Units 1 and 2. Therefore, it is recommended that the licensee's proposed alternative, to examine the terminal end welds on the lower regenerative heat exchanger sub-vessels, be authorized pursuant to 10 CFR 50.55a(a)(3)(ii). For the other components in Relief Request NDE-18, it is recommended that the previous conditional granting of relief pursuant to 10 CFR 50.55a(g)(6)(i) in the August 7, 1995, and August 8, 1995, SERs remain in effect.