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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO THE SECOND 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN

REQUEST FOR RELIEF NO. 96-001

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT 1

DOCKET NOS. 50-313

1.0 INTRODUCTION

The Technical Specifications (TS) for Arkansas Nuclear One (ANO), Unit 1, states 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 (B&PV) 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). The 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 difficulty 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 pre-service 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) 12 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 ANO, Unit 1 second 10-year inservice inspection (ISI) interval is the 1980 edition through the Winter 1981 addenda.

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

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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 12, 1996, Entergy Operations Inc. (licensee), submitted to the NRC Second 10-Year Inservice Inspection Interval Request for Relief No. 96-001 for ANO, 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 10-year inservice inspection interval alternative contained in Request for Relief No. 96-001 for ANO, Unit 1. Based on the information submitted, the staff adopts the contractor's conclusions and recommendations presented in the Technical Letter Report (TLR) attached hereto.

The staff has reviewed the licensee's proposed alternative contained in Request for Relief No. 96-001 to use a sampling philosophy and perform volumetric examination on the Class 1 nozzles and inner radius (IR) sections of only one steam generator in lieu of the Code requirement of volumetric examination of all Class 1 steam generator nozzles and nozzle IR sections. The staff concluded that: 1) pursuant to 10 CFR 50.55a(a)(3)(i), the licensee's proposed alternative does not provide an acceptable level of quality and safety; 2) pursuant to 10 CFR 50.55a(a)(3)(ii), the licensee has not provided a basis for undue hardship, based on the limited number and safety significance of the nozzles; and 3) pursuant to 10 CFR 50.55a(g)(6)(i), the licensee has not provided basis for impracticality. Therefore, the licensee's Request for Relief No. 96-001 is denied.

Attachment: TLR

Principal Contributor: T. McLellan

Date: November 25, 1996

TECHNICAL LETTER REPORT
ON THE SECOND 10-YEAR INSERVICE INSPECTION INTERVAL
PROPOSED ALTERNATIVE 96-001
FOR
ENTERGY OPERATIONS, INC.
ARKANSAS NUCLEAR ONE, UNIT 1
DOCKET NUMBER: 50-313

1.0 INTRODUCTION

By letter dated June 12, 1996, Entergy Operations Inc., submitted Proposed Alternative 96-001. The Idaho National Engineering Laboratory (INEL) staff has evaluated this proposal in the following section.

2.0 EVALUATION

The Code of record for the Arkansas Nuclear One, Unit 1, second 10-year inservice inspection interval is the 1980 Edition through Winter 81 Addenda of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code, Section XI. The information provided by the licensee in support of the proposed alternative to Code requirements has been evaluated and the basis for disposition is documented below.

Proposed Alternative 96-001, Examination Category B-D, Items B3.130 and B3.140, Steam Generators Full Penetration Nozzle Welds and Nozzle Inner Radius Sections

Code Requirement: Examination Category B-D, Items B3.130 and B3.140 require volumetric examination of all Class 1 nozzles and nozzle inner radius sections as defined by Figure IWB-2500-7.

Licensee's Proposal: The licensee has proposed to use an alternative inspection approach for ASME Class 1, Examination Category B-D pressure-retaining full-penetration nozzle-to-vessel welds and nozzle to inner radius sections in steam generators.

Licensee's Basis for Proposed Alternative (as stated):

"The Code of Federal Regulations 10 CFR 50.55a(g) and ANO-1 Technical Specification 4.0.5 require that ASME Code Class 1, 2, and 3 systems be routinely inspected as an assurance of continued structural integrity of the pressure boundary. These regular inspections must be performed per Section XI of the ASME Boiler and Pressure Vessel Code. Section XI, which is entitled "Rules for Inservice Inspection of Nuclear Power Plant Components", requires the inspection of all Class 1 nozzle-to-vessel welds (Code Category B-D) once during each 10-year interval of operation. The upcoming ANO-1 outage (1R13) in mid-September 1996 will conclude the second inservice inspection interval.

"B & W nuclear power plants experience has shown that these nozzle welds and inner radii have no known active failure mechanisms which are likely to threaten their structural integrity. The Code requirement to inspect all of these nozzles is overly conservative and results in excessive costs and unnecessary personnel radiation exposures. A more reasonable approach to the inspection of these nozzle welds would be to perform a sampling of the nozzles. This sampling approach is used on most other components in commercial nuclear power plants.

"At ANO-1 the total number of Code Category B-D nozzle welds is 19, distributed as follows:

Reactor Vessel	8
Steam Generator E24A	3
Steam Generator E24B	3
Pressurizer	5

"All of these nozzle welds were inspected when the vessels were fabricated. They were inspected again as a Preservice examination before ANO-1 went into commercial service. During the first 10-year interval, they were all inspected again. During the second 10-year interval, 17 of these 19 nozzle welds have again been inspected. The remaining 2 nozzles are on the bottom head of steam generator E24B and are scheduled to be examined during refueling outage 1R13.

"As an alternative to the Code-required examination scope, ANO-1 proposes to examine all of the Code Category B-D nozzles on one of the steam generators rather than both steam generators. This proposal is similar to the examination requirements on Class 2 steam generator nozzles (Code Category C-B) and is consistent with the general philosophy of Section XI, which is to take a representative sample [of] all safety-related components and items. Other examples of the sampling approach are contained in Code Categories B-B (class 1 vessel welds) and B-J (Class 1 piping welds).

"Approval of this relief request by NRC would delete the 2 remaining nozzle weld examinations and 2 inner radii inspections for the current interval. Cancellation of the examinations would save ANO-1 approximately $65,000 in unnecessary inspection costs with no added safety benefit. Deletion of these examination would also reduce the personnel radiation exposure by 4.1 Person-Rem for this inspection.

"As part of the continuing regularly-scheduled inservice inspection scope, all of the other Category B-D welds have been examined ultrasonically. In addition, the steam generators receive a visual (VT-2) examination each refueling outage. No service-induced cracking or degradation has been found either with the ultrasonic examinations or with the visual inspections. Since no service-induced flaws have been found in any of the Category B-D welds at ANO-1 during the many examinations that have already been performed, a high degree of confidence exists in the structural integrity of the steam generator nozzle welds and associated inner radius sections."

Licensee's Proposed Alternative Examination (as stated):

"ANO-1 proposes to examine all of the Code Category B-D nozzles on one of the steam generators rather than both steam generators. For ANO-1, this would require that one steam generator be inspected every inspection interval. Approval of this relief request by NRC would no longer require the two remaining nozzle weld examinations and two inner radii inspections for this current inspection interval."

Evaluation: Examination Category B-D, Items B3.130 and B3.140 require volumetric examination of all Class 1 steam generator nozzles and nozzle inner radius (IR) sections. The licensee proposed a sample strategy and volumetric examination on the Class 1 nozzles and inner radii of only one steam generator.

The Code of record at ANO-1 for the second interval is the 1980 Edition through Winter 81 Addenda. The latest version of the Code approved for use by the NRC is the 1989 Edition of Section XI. The most recent edition published by ASME is the 1995 Edition of Section XI. These Code editions all require the examination of 100% of the Class 1 nozzles. Examination of these nozzles can not be considered impractical since they were examined during the last interval. Further, these examinations are required due to the safety significance and associated stress levels at gross structural discontinuities for the nozzles. Since the nozzle

population for Class 1 is only nineteen, a sample sampling would not be adequate due to the safety significance of the nozzles. Therefore, based on the small number of Class 1 nozzles, the licensee's proposed alternative does not provide an acceptable level of quality and safety. In addition, the licensee did not provide a case for hardship or unusual difficulty. Therefore, because of the safety significance of the nozzles, the INEL staff recommends that the licensee's alternatives be denied.

3.0 CONCLUSION

The INEL staff has reviewed the licensee's submittal and concluded that: 1) pursuant to 10 CFR 50.55a(a)(3)(i), the licensee's proposed alternative does not provide an acceptable level of quality and safety; 2) pursuant to 10 CFR 50.55a(a)(3)(ii), the licensee has not provided a basis for undue hardship, based on the limited number and safety significance of the nozzles; and 3) pursuant to 10 CFR 50.55a(g)(6)(i), the licensee has not provided basis for impracticality. Therefore, it is recommended that the licensee's proposed alternative be denied.