



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SECOND 10-YEAR INTERVAL INSERVICE INSPECTION PLAN

REQUEST FOR RELIEF NO. RR-56

SOUTHERN NUCLEAR OPERATING COMPANY

JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 1

DOCKET NO. 50-348

1.0 INTRODUCTION

The Technical Specifications (TSs) for Joseph M. Farley Nuclear Plant (Farley) 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 the ASME Boiler and Pressure Vessel (B&PV) Code (ASME Code), Section XI and applicable addenda as required by Title 10 of the Code of Federal Regulations (10 CFR) Section 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(6)(g)(i). Section 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 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) 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 Farley Unit 1, second 10-year inservice inspection (ISI) interval is the 1983 Edition through Summer 1983 Addenda.

2.0 EVALUATION

By letter dated August 28, 1998, Southern Nuclear Operating Company (licensee) submitted its Second 10-Year Interval Inservice Inspection Program Plan Request for Relief No. RR-56 for

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Enclosure

Farley, Unit 1. The Idaho National Engineering and Environmental Laboratory (INEEL), has evaluated the information provided by the licensee in support of its Second 10-Year Interval Inservice Inspection Program Request for Relief No. RR-56 for Farley Unit 1. Based on the results of the review, the staff adopts the contractor's conclusions and recommendations presented in the Technical Letter Report (TLR) attached.

The information provided by the licensee in support of the requests for relief from the Code requirements has been evaluated and the basis for disposition is documented below.

Request for Relief No. RR-56: ASME Code, Section XI, Examination Category C-A, Item C1.30 requires 100 percent volumetric examination, as defined by Figure IWB-2500-2, for tubesheet-to-shell welds each inspection interval. Examination Category F-B, requires a visual (VT-3) examination each inspection interval, as defined by Figure IWF-1300-1 each inspection interval.

Pursuant to 10 CFR 50.55a(a)(3)(ii), the licensee proposed an alternative to the Code examination requirements for the regenerative heat exchanger tubesheet-to-shell Weld ALA2-3560-2 and component Supports ALA2-3560-CS-5 and CS-6. A VT-2 visual examination will be performed as required by the Code.

The Code requires 100 percent volumetric examination of the subject Class 2 Regenerative Heat Exchanger tubesheet-to-shell weld, and a visual (VT-3) examination of the two subject component supports. However, examination of these items is restricted due to extreme radiological conditions and component geometric configuration. The heat exchanger is fabricated from materials which restrict ultrasonic examination to a half-node technique. The licensee states that when using a half-node technique, the geometric configuration of the weld surface limits the volumetric examination of the tubesheet-to-shell weld to an estimated 50 percent of the required volume. Radiation dose rates are estimated at 2500 mrem to complete the examination of the two subject supports and only 50 percent of the required volume of the vessel weld can be completed. Based on the ALARA concerns surrounding the performance of these examinations, and the limited access to the subject weld, imposition of the Code requirements would result in a significant hardship. Further, the inlet and outlet piping to this heat exchanger is exempt from Code volumetric and surface examination requirements, based on size (3-inch NPS). The staff concluded that a compensating increase in the level of quality and safety would not be provided by requiring the licensee to examine the heat exchanger, yet exclude connecting piping. The VT-2 visual examination for evidence of leakage, performed during the system hydrostatic test provides reasonable assurance of the continued operational readiness of the regenerative heat exchanger welds and supports. Pursuant to 10 CFR 50.55a(a)(3)(ii), the staff concluded that the licensee's proposed alternative is authorized for the current interval.

3.0 CONCLUSION

The staff concluded that for Request for Relief No. RR-56, imposition of the Code requirements results in a hardship without a compensating increase in the level of quality and safety and that the licensee's proposed alternative provides reasonable assurance of structural integrity of the

subject component. Therefore, the staff concludes that the licensee's proposed alternative is authorized pursuant to 10 CFR 50.55a(3)(ii) for the current interval.

Attachment: Technical Letter Report

Principal Contributor: T. McLellan

Date: November 16, 1998

TECHNICAL LETTER REPORT
ON
SECOND 10-YEAR INTERVAL INSERVICE INSPECTION
REQUEST FOR RELIEF NO. RR-56
FOR
SOUTHERN NUCLEAR OPERATING COMPANY
JOSEPH M. FARLEY NUCLEAR PLANT, UNIT 1
DOCKET NUMBER: 50-348

1. INTRODUCTION

By letter dated August 28, 1998, the licensee, Southern Nuclear Operating Company, submitted Request for Relief No. RR-56, seeking relief from the requirements of the ASME Code, Section XI, for the Joseph M. Farley Nuclear Plant, Unit 1, for the second 10-year inservice inspection (ISI) interval. The Idaho National Engineering and Environmental Laboratory (INEEL) staff's evaluation of the subject request for relief is in the following section.

2. EVALUATION

The information provided by Southern Nuclear Operating Company in support of the request for relief from Code requirements has been evaluated and the basis for disposition is documented below. The Code of record for the Joseph M. Farley Nuclear Plant, Unit 1, second 10-year ISI interval, which began December 1, 1987, is the 1983 Edition through Summer 1983 Addenda of Section XI of the ASME Boiler and Pressure Vessel Code.

- A. Request for Relief, No. RR-56, Examination Category C-A, Item C1.30, Regenerative Heat Exchanger Tubesheet-to-Shell Weld and Examination Category F-B, Component Supports

Code Requirement: Examination Category C-A, Item C1.30 requires 100 percent volumetric examination, as defined by Figure IWB-2500-2, for tubesheet-to-shell welds each inspection interval. Examination Category F-B, requires a visual (VT-3) examination each inspection interval, as defined by Figure IWF-1300-1 each inspection interval.

Licensee's Proposed Alternative: Pursuant to 10 CFR 50.55a(a)(3)(ii), the licensee proposed an alternative to the Code examination requirements for the regenerative heat exchanger tubesheet-to-shell Weld ALA2-3560-2 and component Supports ALA2-3560-CS-5 and CS-6. A VT-2 visual examination will be performed as required by the Code.

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

ATTACHMENT

"The Regenerative Heat Exchanger is a Class 2 heat exchanger that is designed to reduce unnecessary heat losses by heating the Reactor Coolant system (RCS) charging flow with the letdown flow. The 3" charging inlet/outlet lines are connected to the heat exchanger on the tube side, and the 3" letdown inlet/outlet lines are connected on the shell side. All of the 3" lines are exempt from non-destructive examinations per IWC-1220(c); however, the heat exchanger requires examination. The examination of the Regenerative Heat Exchanger is considered to constitute an unnecessary hardship without an associated increase in the level of quality and safety. This conclusion is based on the following.

1. "Previous dose rate surveys and data for Unit 1 Regenerative Heat Exchanger examinations indicate a contact dose rate of approximately 2800 mrem/hr with a cumulative whole body dose of approximately 2500 mrem associated with the examination of a weld. This whole body dose for examination of one weld is considered by SNC to constitute a hardship.
2. "As shown in Request RR-18, the Regenerative Heat Exchanger shell is fabricated from materials which restrict ultrasonic examination to a half-node technique. Using a half-node technique, the geometric configuration of the weld surface limits volumetric examinations to approximately half of the required examination volume. SNC considers this a minimal examination for the amount of corresponding dose. Also, as shown in RR-18, surface examinations are currently performed to supplement the limited volumetric examination; however, they are of limited use on the ID defects.
3. "The subject weld and two piping supports are located on a component where all of the numerous welds and supports on the connecting lines are exempt from non-destructive examination. Not performing the examination of one weld and two supports in a system where almost all of the welds and supports do not require examination should have no effect on the level of quality and safety for this system."

Justification

"A radiation dose of 2500 mrem for the examination of two supports and one weld, where the ultrasonic examination of the weld is limited to approximately one-half of the required volume, is considered a hardship by SNC. The function of the heat exchanger and associated piping is to provide a flow path for charging and letdown to and from the RCS. The level of quality and safety should not be decreased by deletion of the subject examinations on a component, because it is located in piping exempt from nondestructive examinations. The pressure tests which are performed on this section of piping will provide adequate assurance of the integrity of the component and piping in the flow path; therefore, approval is requested per the requirements of 10 CFR 50.55a(a)(3)(ii)."

Evaluation: The Code requires 100 percent volumetric examination of the subject Class 2 Regenerative Heat Exchanger tubesheet-to-shell weld, and a visual (VT-3) examination of the two subject component supports. However, examination of these items is restricted due to extreme radiological conditions and component geometric configuration. The heat exchanger is fabricated from materials which restrict ultrasonic examination to a half-node technique. The licensee states that when using a half-node technique, the geometric configuration of the weld surface limits the volumetric examination of the tubesheet-to-shell weld to an estimated 50 percent of the required volume. Radiation dose rates are estimated at 2500 mrem to complete the examination of the two subject supports and only 50 percent of the required volume of the vessel weld can be completed. Based on the ALARA concerns surrounding the performance of these examinations and the limited access to the subject weld, imposition of the Code requirements would result in a significant hardship. Further, the inlet and outlet piping to this heat exchanger is exempt from Code volumetric and surface examination requirements, based on size (3-inch NPS). Therefore, a compensating increase in the level of quality and safety would not be provided by requiring the licensee to examine the heat exchanger, yet exclude connecting piping. The VT-2 visual examination for evidence of leakage, performed during the system hydrostatic test will provide reasonable assurance of the continued operational readiness of the regenerative heat exchanger welds and supports. Therefore, pursuant to 10 CFR 50.55a(a)(3)(ii), it is recommended that relief be authorized.

3. CONCLUSION

The INEEL staff evaluated the licensee's submittal and concluded that for Request for Relief No. RR-56, imposition of the Code requirements would result in a hardship without a compensating increase in the level of quality and safety. Therefore, it is recommended that the request for relief be authorized pursuant to 10 CFR 50.55a(3)(ii)