



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

REQUEST FOR APPROVAL TO REPAIR FLAWS IN ACCORDANCE WITH

GENERIC LETTER 90-05

FOR ASME CODE CLASS 3 SERVICE WATER PIPING

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNITS 1 AND 2

DOCKET NOS. 50-313 AND 50-368

1.0 INTRODUCTION

10 CFR 50.55a(g) requires nuclear power facility piping and components to meet the applicable requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (hereafter referred to as the Code). Section XI of the Code specifies Code-acceptable repair methods for flaws that exceed Code acceptance limits in piping that is in-service. A Code repair is required to restore the structural integrity of flawed Code piping, independent of the operational mode of the plant when the flaw is detected. Those repairs not in compliance with Section XI of the Code are non-Code repairs. However, the implementation of required Code (weld) repairs to ASME Code Class 1, 2 or 3 systems is often impractical for nuclear licensees since the repairs normally require an isolation of the system requiring the repair, and often a shutdown of the nuclear power plant.

Alternatives to Code requirements may be used by nuclear licensees when authorized by the Director of the Office of Nuclear Reactor Regulation if the proposed alternatives to the requirements are such that they are shown to provide an acceptable level of quality and safety in lieu of the Code requirements [10 CFR 50.55a(a)(3)(i)], or if compliance with the Code requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety [10 CFR 50.55a(a)(3)(ii)].

A licensee may also submit requests for relief from certain Code requirements when a licensee has determined that conformance with certain Code requirements is impractical for its facility [10 CFR 50.55a(g)(5)(iii)]. Pursuant to 10 CFR 50.55a(g)(6)(i), the Commission will evaluate determinations of impracticality and may grant relief and may impose alternative requirements as it determines is authorized by law.

Generic Letter (GL) 90-05, "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2 and 3 Piping," dated June 15, 1990, provides guidance for the staff in

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evaluating relief requests submitted by licensees for temporary non-Code repairs of Code Class 3 piping. The staff uses the guidance in GL 90-05 as its criteria for making its safety evaluation of relief requests for temporary non-Code repairs of Code Class 3 piping.

2.0 BACKGROUND

Entergy Operations, Inc., (hereafter referred to as the licensee) discovered at Arkansas Nuclear One (ANO), Units 1 and 2, various locations with evidence of less than minimum wall thickness as required by the ASME Code, resulting from microbiologically induced corrosion (MIC). In all cases, the licensee requested, pursuant to 10 CFR 50.55a(g)(6)(i), a relief from the ASME Code, Section XI replacement requirements. The licensee based its request for relief on the results of a "through-wall flaw" evaluation that was performed in accordance with the guidelines and acceptance criteria contained in GL 90-05. The Nuclear Regulatory Commission (NRC) staff reviewed those requests and granted relief from the ASME Code requirements for each of the submitted reliefs. On November 4, 1996, the licensee submitted a request for generic relief for certain lines of the service water system because the failure mechanism of the previously identified leaks was determined to be MIC. The original request was supplemented with a minor correction on November 15, 1996. On January 21, 1999, the licensee supplemented its relief request by identifying each and every line for which the relief would be applied. The purpose of the generic request is to avoid the submittal of a specific relief request to the NRC for each newly discovered pin hole leak or location with possible evidence of previous leakage identified during routine service water system piping walkdowns.

3.0 LICENSEE'S RELIEF REQUEST

3.1 Components for Which Relief is Requested

The following is a list of drawings which is provided as an aid in defining the scope of the generic relief sought by the licensee. The affected service water system line segments covered by this relief request can be more accurately identified using the piping line number identifier. The piping line numbers for the pipe segments covered by this relief request are also listed and cross referenced to the applicable drawing.

Unit 1: DRAWING M210, SHEET 1

HBD-13	HBD-20	HBD-45
HBD-14	HBD-21	HBD-46

Unit 2: DRAWING M2210, SHEETS 1 and 3

2HBC-32	2HBC-33	2HBC-34
2HBC-41	2HBC-50	2HBC-51
2HBC-61	2HBC-63	2HBC-68
2HBC-69	2HBC-75	2HBC-77

Unit 2: DRAWING M2210, SHEETS 1 and 3 (con't)

2HBC-78	2HBC-81	2HBC-83
2HBC-87	2HBC-88	2HBC-97
2HBC-98	2HBC-103	2HBC-104
2HBC-105	2HBC-106	2HBC-192

The above listed piping lines are identified in accordance with the following piping designations:

Pressure Rating: H = 150 psig piping
 Piping Material: B = Carbon Steel
 Code Class: C = ANSI B31.7, Code Class III or
 D = ANSI B31.1

3.2 Applicable Section XI Edition for Arkansas Nuclear One, Units 1 and 2

Arkansas Nuclear One Unit 1: 1980 Edition of the ASME Code, Section XI through and including winter 1981 Addenda.

Arkansas Nuclear One Unit 2: 1986 Edition of the ASME Code, Section XI.

3.3 ASME Section XI Code Requirement

The ASME Code Section XI requires that repairs or replacements of ASME Code Class components be performed in accordance with rules found in Articles IWA-4000 or IWA-7000, respectively. The intent of these rules serves to provide an acceptable means of restoring the structural integrity of a degraded Code Class system back to the original design requirements.

3.4 Content of the Relief Request

Relief is sought from performing a repair or replacement of the service water piping per the requirements of Article IWA-4000 or IWA-7000, respectively, and from submitting to the NRC a relief request for each and every observation of evidence of pin hole leaks in the piping of the service water system listed above. This relief request establishes a plan for continued operation with through-wall flaws in service water system piping based upon the guidance provided in GL 90-05. Relief is being sought because performing a Code repair within the limiting conditions of the service water system operation may be impracticable without a compensating increase in the level of quality and safety.

3.5 Basis for Relief

The licensee has submitted request for relief and proposed alternatives to the Code requirement. The NRC staff reviewed the proposed alternatives for compliance with the provisions of 10 CFR 50.55a(a)(3)(ii). The licensee has committed to evaluate any subsequently identified flaw in accordance with the guidance provided in GL 90-05. Based upon the evaluation, it will be established whether the discovered flaws satisfy the criteria for

non-code repair as described in GL 90-05. The evaluation will also determine whether performing permanent repairs in accordance with the ASME Code within the time period permitted by the limiting condition for operation of the service water system TS would be possible during plant operation. If the repair would necessitate a plant shutdown, the repair would be considered impractical.

3.6 Licensee's Alternative Program

As an alternative to performing Code repairs in accordance with IWA-5250(a)(2) to flaws in the service water system meeting the criteria for non-code repair of GL 90-05, the flaws will be left as found. The flaw will be monitored for leakage and must meet the criteria for flooding and spraying consequences and for structural integrity as described in GL 90-05 to remain in service. All flaws identified meeting the criteria of GL 90-05 will be repaired at the next outage exceeding 30 days, but not later than the next scheduled refueling outage from the time of discovery.

Piping sections identified above are prioritized and replaced based on ultrasonic testing mapping results. This alternative to the Code requirement will be followed until all of the piping identified above is replaced.

Augmented inspections will be performed in accordance with GL 90-05 on other piping segments that are considered to be the most susceptible to similar identified degradation.

4.0 STAFF EVALUATION AND CONCLUSIONS

4.1 Operability Determination, Root Cause Analysis and Structural Integrity Evaluation

The licensee has proposed to use the guidance provided in GL 90-05 to assess newly discovered flaws in certain lines of the service water system. The system was constructed in accordance with the requirements of ANSI B31.7, Class 3 or ANSI B31.1 and treated as Class 3 piping.

4.2 Augmented Inspection

To assess the overall degradation of the service water system, an augmented inspection program has been developed. The augmented program is performed in accordance with GL 90-05 on other piping segments that are considered by the licensee to be most susceptible to similar identified degradation.

4.3 Proposed Temporary Non-code Repair and Monitoring Provisions

As an alternative to performing Code repairs in accordance with IWA-5250(a)(2) for newly discovered flaws in the service water system, the flaws will be left as found. The flaw will be monitored for leakage and must meet the criteria for flooding and spraying consequences and for structural integrity as described in GL 90-05 to remain in service. All piping identified with flaws will be replaced during the next scheduled outage exceeding 30 days, but no later than the next scheduled refueling outage. This alternative to the Code requirement will be followed until completion of the service water piping replacement project. The structural integrity of the

service water system will be monitored by the visual and nondestructive examinations as stated in GL 90-05 until the repairs required by IWA 5250(a)(2) are completed.

4.4 Staff Conclusions

The staff has determined that the licensee's proposed flaw evaluation has been consistent with the guidelines and acceptance criteria of GL 90-05. The staff, therefore, finds the licensee's proposed approach acceptable to perform future structural integrity and operability assessments of the carbon steel piping as listed in paragraph 3.1 above.

The licensee has requested a relief from the burden to submit a relief request to the NRC for each and every through-wall leak discovered in certain carbon steel piping of the service water system. The staff finds this request to be reasonable because: (1) the licensee adheres to the guidance of GL 90-05, as described above, up to the point of actually submitting a relief request to the NRC; (2) each occurrence of flaw detection is documented in the ANO corrective action system; and, (3) all relevant documentation is available for NRC staff review.

Furthermore, the staff finds that performance of an immediate Code repair after each and every newly discovered flaw caused by MIC would have constituted an undue burden (create undue hardship) upon the licensee since the repair may exceed the time limits imposed by the governing TS and thus necessitate the isolation of portions of the service water system. Isolating portions of the service water system to perform a Code repair is not in the best interest of plant safety, given the magnitude of the flaw and the licensee's alternative program. The staff, therefore, concludes that relief is warranted pursuant to 10 CFR 50.55a(a)(3)(ii), in that compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety. The staff concludes that the licensee's alternative program would provide an acceptable level of quality and safety.

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Date: March 31, 1999