

**L. M. Stinson (Mike)**  
Vice President

**Southern Nuclear  
Operating Company, Inc.**  
40 Inverness Center Parkway  
Post Office Box 1295  
Birmingham, Alabama 35201

Tel 205.992.5181  
Fax 205.992.0341



*Energy to Serve Your World™*

February 23, 2004

Docket Nos.: 50-348  
50-364

NL-04-0178

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, D. C. 20555-0001

**Joseph M. Farley Nuclear Plant – Unit 1 and 2  
ASME Section XI Request for Relief Number RR-55  
Temporary Non-Code Repair of Service Water Piping**

Ladies and Gentlemen:

The purpose of this letter is to request, consistent with the intent of NRC Generic Letter (GL) 90-05, relief from the ASME Boiler and Pressure Vessel Code Section XI requirements pursuant to 10 CFR 50.55a(g)(6)(i). The enclosed request for relief RR-55 is submitted in accordance with the provisions of 10 CFR 50.55a to provide relief to allow temporary non-Code repairs of a Farley Nuclear Plant (FNP) Unit 1 through-wall pinhole leak on a section of piping that provides the backup Service Water to the 1B motor-driven Auxiliary Feedwater pump and of a FNP Unit 2 through-wall pinhole leak on a section of piping that provides Service Water makeup to the Circulating Water canal. Both sections of piping are ASME Code Class 3 piping. ASME Section XI repairs or replacements will be performed during the next corresponding unit refueling outage or the next corresponding unit scheduled outage exceeding 30 days, whichever occurs first.

Evaluations performed per the guidance of GL 91-18 and GL 90-05 indicate these leaks resulted from non-crack flaws. It has been determined that the structural integrity of the Service Water piping at these locations has not been impaired and the leakage does not prevent systems from performing their safety functions.

In the past, disposition of such flaws has been to determine structural integrity and to perform evaluations per GL 91-18 and GL 90-05, address system impacts and interactions with other systems, and to perform permanent repairs during the next outage of sufficient length. Such actions were not considered to constitute utilization of temporary repairs, thus no requests for relief were submitted. Southern Nuclear Operating Company has concluded that for the subject leaks and future non-crack through-wall flaws in Class 3 piping where prompt repair is impractical, disposition will include evaluation, temporary repair and requests for relief as necessary, utilizing the guidance of GL 91-18 and GL 90-05.

A047

This letter contains no NRC commitments. If you have any questions, please advise.

Sincerely,



L. M. Stinson

LMS/JLS/sdl

Enclosures: Enclosures 1A and 1B - Request for Relief RR-55

cc: Southern Nuclear Operating Company  
Mr. J. B. Beasley, Jr., Executive Vice President  
Mr. D. E. Grissette, General Manager – Plant Farley  
Document Services RTYPE: CFA04.054; LC# 13944

U. S. Nuclear Regulatory Commission  
Mr. L. A. Reyes, Regional Administrator  
Mr. S. E. Peters, NRR Project Manager – Farley  
Mr. C. A. Patterson, Senior Resident Inspector – Farley

**Joseph M. Farley Nuclear Plant – Unit 1 and Unit 2  
ASME Section XI Request for Relief Number RR-55  
Temporary Non-Code Repair of Service Water Piping**

**Enclosure 1A and Enclosure 1B**

Joseph M. Farley Nuclear Plant – Unit 1  
ASME Section XI Request for Relief Number RR-55  
Temporary Non-Code Repair of Service Water Piping

**UNIT:** Farley Unit-1

**COMPONENT:** 8-inch Nominal Pipe Size (NPS) carbon steel pipe

**SYSTEM:** Service Water (SW)

**ASME CODE  
CLASS:** 3

**FUNCTION:** This section of piping provides the backup Service Water to the 1B motor-driven Auxiliary Feedwater pump.

**CODE  
REQUIREMENT:** When an American Society of Mechanical Engineers (ASME), Section XI Code repair or replacement is performed, the requirements of ASME, Section XI, IWA-4000 or IWA-7000 must be satisfied, respectively, in order to restore the system's structural integrity back to its original design requirements.

**ALTERNATIVE  
REQUIREMENT:** In place of the ASME Code requirements, Southern Nuclear Operating Company (SNC) is implementing the alternative requirements of NRC Generic Letter (GL) 90-05 until the next refueling outage or during a scheduled Unit 1 outage exceeding 30 days, whichever occurs first.

Although SNC met many of the requirements of GL 90-05 when the leak on this piping was first discovered in November 2003, it is important to note that not all of the steps of the Generic Letter were done at that time. Since then, SNC has determined that this and future uses of GL 90-05 will include a complete implementation of these requirements. Thus, SNC has re-evaluated this leak, implementing the requirements of GL 90-05, as documented by this request for relief.

**POSITIVE FLAW  
DETECTION  
DURING PLANT  
OPERATION:**

On November 1, 2003, a through-wall leak was discovered in the Service Water system. The leak is located upstream of MOV3209 in the carbon steel 8-inch supply line to the 1B MDAFW. The leak is located between MOV3209 and the feed to the MDAFW pump room cooler and is located about 15 feet above the pump. The pinhole leak is located in the lower section of the pipe weld cap about a tenth of an inch from the edge. The leak rate was approximately 40 drops per minutes (dpm). The initial leakage is documented in Farley Condition Reports #2003002999 and #2003003034.

**IMPRACTICALITY  
OF REPAIR:**

Repair of this location is not possible while the plant is in operation since no isolation valves exist between the leak location and the B-train Service Water supply header to the Auxiliary Building.

**ROOT CAUSE  
DETERMINATION:**

The root cause for the piping degradation is considered to be due to microbiological induced corrosion (MIC). Experience from the Service Water Radiography (RT) program indicates a propensity for MIC attack to occur in the sensitized areas of welds. The RT shows non-crack-like rounded and/or irregularly shaped indications characteristic of MIC.

**FLAW  
CHARACTERIZATION:**

The flaw is located very close to the base metal/weld interface on the pipe side of the pipe to elbow weld. The exterior size of the pinhole was 1/16-inch diameter. The RT film showed the flaw to be irregular in shape through the wall thickness. The overall dimensions taken from the RT film are 0.277-inch in the axial direction and 0.481-inch in the circumferential direction. Volumetric examination of this weld detected other indications: (1) at approximately 6-inches from the original through wall flaw, a flaw of 0.385-inch diameter was found and assumed to be encroaching on the ASME minimum wall; (2) at approximately 12-inches from the original through wall flaw, a flaw of 0.442-inch diameter was found and assumed to be encroaching on the ASME minimum wall; and (3) at approximately 1-inch circumferentially and 2-inches axially away from the original flaw, a base metal spot flaw of 0.113-inch wall thickness and having a diameter less than the original flaw was found.

**EVALUATION  
APPROACH  
AND RESULTS:**

Since a through-wall flaw had been found at this location, SNC chose to perform the evaluation on that basis.

A combination of volumetric (radiography and ultrasonic) examinations were performed on the flaw. This information was used to perform the structural integrity calculation required by GL 90-05 by the through-wall method. The results of this evaluation show that the largest calculated stress intensity factor "K" of  $34.64 \text{ ksi}(\text{in})^{1/2}$  is less than the  $35 \text{ ksi}(\text{in})^{1/2}$  acceptance criteria for carbon steel.

Engineering personnel reviewed the design requirements for this system and have determined that this amount of leakage does not prevent it from performing its safety function. This will not have an impact to safety related equipment downstream of the leak since this is a back-up supply of water to the AFW system and is not normally used. The impact of this leakage on components in the area was also evaluated and it was determined that those components would not be adversely affected by leakage or spray. The existing leakage is being collected in a bucket; therefore, other components are not being affected by this leakage. Leakage is being monitored by the weekly walkdown of this area and appropriate action to prevent further leakage and spray will be taken as needed. The current leak rate is not sufficient to cause a flood level that will affect any safety related component in less than a week's time.

Based on the above, SNC determined that the structural integrity of the Service Water piping at this location has not been impaired.

**AUGMENTED  
EXAMINATIONS:**

The piping with the initial flaw is moderate energy piping and therefore, five other susceptible locations were chosen for the augmented volumetric examinations per GL 90-05. No flaws were detected by these examinations; thus, SNC has concluded that the initial leak is a localized condition.

**PROPOSED  
TEMPORARY  
NON-CODE  
REPAIR:**

Based on the evaluation above, SNC requests relief from ASME Section XI Code. SNC plans to leave this piping "as is" with a banded rubber patch that will direct leakage to a container. The total weight of this patch is less than 20 pounds which is considered negligible from a pipe loading standpoint. The leakage is negligible and does not present a maintenance or operational problem. The GL 90-05 evaluation shows that this piping still has structural integrity. Based on the continued monitoring discussed below, SNC will reevaluate the need for additional housekeeping measures as appropriate.

**GL 90-05**

**ACTION PLAN:**

An ASME Section XI repair or replacement will be performed before the completion of the Farley Unit 1 1R19 refueling outage or during a scheduled Unit 1 outage exceeding 30 days, whichever occurs first. The 1R19 outage is scheduled to begin in October 2004.

Two actions will be performed by SNC for this component until the ASME Section XI repair or replacement is performed.

- Operations will perform a weekly qualitative assessment of leakage with the housekeeping patch installed to identify any degradation of structural integrity. If the leak rate increases significantly, an engineering evaluation will be performed to determine the need for additional action, including a re-assessment of structural integrity.
- A follow-up volumetric examination will be performed on or before each three-month anniversary of the completion of the original examination until the repair or replacement is completed.

**STATUS OF**

**REQUEST FOR RELIEF:**

This request for relief is awaiting NRC approval.

Joseph M. Farley Nuclear Plant – Unit 2  
ASME Section XI Request for Relief Number RR-55  
Temporary Non-Code Repair of Service Water Piping

**UNIT:** Farley Unit-2

**COMPONENT:** 20-inch Nominal Pipe Size (NPS) carbon steel pipe

**SYSTEM:** Service Water (SW)

**ASME CODE  
CLASS:** 3

**FUNCTION:** This section of piping provides Service Water makeup to the Circulating Water canal in order to maintain proper Circulating Water inventory to support main condenser operation.

**CODE  
REQUIREMENT:** When an American Society of Mechanical Engineers (ASME), Section XI Code repair or replacement is performed, the requirements of ASME, Section XI, IWA-4000 or IWA-7000 must be satisfied, respectively, in order to restore the system's structural integrity back to its original design requirements.

**ALTERNATIVE  
REQUIREMENT:** In place of the ASME Code requirements, Southern Nuclear Operating Company (SNC) is implementing the alternative requirements of NRC Generic Letter (GL) 90-05 until the next refueling outage or during a scheduled Unit 2 outage exceeding 30 days, whichever occurs first.

Although SNC met many of the requirements of GL 90-05 when the leak on this piping was first discovered in November 2002, it is important to note that not all of the steps of the Generic Letter were done at that time. Since then, SNC has determined that this and future uses of GL 90-05 will include a complete implementation of these requirements. Thus, SNC has re-evaluated this leak, implementing the requirements of GL 90-05, as documented by this request for relief.

**POSITIVE FLAW  
DETECTION  
DURING PLANT  
OPERATION:**

On November 16, 2002, a through-wall leak was discovered in the Service Water system. The leak is located in the carbon steel 20-inch piping of the Service Water makeup to the Circulating Water canal, in valve box 2VB-3. The location is in the weld joining the downstream flange of valve Q2P16V560 to a short pipe section which then goes to the 20-inch/30-inch reducer. The leak rate was approximately 0.25 gallon per minute. The initial leakage is documented in Farley Condition Report #2002002791.

**IMPRACTICALITY  
OF REPAIR:**

Repair of this location is not possible while the plant is in operation since the line supplies makeup water to the Circulating Water canal with a nominal flow rate of 10,000 gpm. No other sources of water are available to supply this amount of water with the unit in operation.

**ROOT CAUSE  
DETERMINATION:**

The root cause for the piping degradation is considered to be due to microbiological induced corrosion (MIC). Experience from the Service Water Radiography (RT) program indicates a propensity for MIC attack to occur in the sensitized areas of welds. The RT shows a non-crack-like rounded shaped indication characteristic of MIC.

**FLAW  
CHARACTERIZATION:**

The flaw is located in the weld approximately 1/8-inch from the base metal/weld interface. The exterior size of the pinhole was 1/16-inch diameter. NDE did not detect any other indications at the original flaw location. The RT indicated that the maximum dimension of the flaw was 0.332 inches and that it was a rounded indication. The flaw extended a short distance out of the weld into the sensitized area of the base metal.

**EVALUATION  
APPROACH  
AND RESULTS:**

Since a through-wall flaw had been found at this location, SNC chose to perform the evaluation on that basis.

A combination of volumetric (radiography and ultrasonic) examinations were performed on the flaw. This information was used to perform the structural integrity calculation required by GL 90-05 by the through-wall method. The results of this evaluation show that the largest calculated stress intensity factor

“K” of  $12.54 \text{ ksi(in)} \exp(1/2)$  is less than the  $35 \text{ ksi(in)} \exp(1/2)$  acceptance criteria for carbon steel.

Engineering personnel reviewed the design requirements for this system and have determined that this amount of leakage does not prevent it from performing its safety function. The impact of this leakage on the components in the valve box was also evaluated and it was determined that those components would not be adversely affected by leakage or spray. Due to the leakage occurring in a valve box, safety related components could be affected by flooding if the existing sump pump fails and the control room high water level alarm fails. This is being addressed by the weekly walkdown of the valve box. Appropriate action to prevent flooding and damage of the components will be taken at that point. The current leak rate is not sufficient to cause a flood level that will affect any safety related component in less than a week’s time.

Based on the above, SNC determined that the structural integrity of the Service Water piping at this location has not been impaired.

**AUGMENTED  
EXAMINATIONS:**

The piping with the initial flaw is moderate energy piping and therefore, five other susceptible locations were chosen in valve box 2VB-3 for the augmented volumetric examinations per GL 90-05. No flaws were detected by these examinations; thus, SNC has concluded that the initial leak is a localized condition.

**PROPOSED  
TEMPORARY  
NON-CODE  
REPAIR:**

Based on the evaluation above, SNC requests relief from ASME Section XI Code. SNC plans to leave this piping “as is” with a banded rubber patch that will direct leakage into an existing floor drain. The total weight of this patch is less than 20 pounds which is considered negligible from a pipe loading standpoint. The leakage is negligible and does not present a maintenance or operational problem. The GL 90-05 evaluation shows that this piping still has structural integrity. Based on the continued monitoring discussed below, SNC will reevaluate the need for additional housekeeping measures as appropriate.

**GL 90-05  
ACTION PLAN:**

An ASME Section XI repair or replacement will be performed before the completion of the Farley Unit 2 2R16 refueling outage or during a scheduled Unit 2 outage exceeding 30 days, whichever occurs first. The 2R16 outage is scheduled to begin in March 2004.

The following action will be performed by SNC for this component until ASME Section XI repair or replacement is performed:

- Operations will perform a weekly qualitative assessment of leakage with the housekeeping patch installed to identify any degradation of structural integrity. If the leak rate increases significantly, an engineering evaluation will be performed to determine the need for additional action, including a re-assessment of structural integrity.
- A follow-up volumetric examination will be performed on or before each three-month anniversary of the completion of the original examination until the repair or replacement is completed.

**STATUS OF  
REQUEST FOR RELIEF:** This request for relief is awaiting NRC approval.