



GULF STATES UTILITIES COMPANY

RIVER BEND STATION POST OFFICE BOX 220 ST. FRANCISVILLE, LOUISIANA 70775
AREA CODE 504 635-6094 346-8851

November 19, 1990
RBG-34034
File Nos. G9.5, 224.600

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Gentlemen:

River Bend Station - Unit 1
Docket No. 50-458

Enclosed are Gulf States Utilities Company's (GSU) results of ultrasonic testing (UT) conducted on the N4A-2 feedwater nozzle-to-safe end weld during the third refueling outage (RF-3) at River Bend Station. An indication was identified in this weld during the second refueling outage (RF-2). As a result a mid-cycle inspection was performed as committed in our letter from Mr. J. E. Booker to you dated May 15, 1989 (RBG-30833) and supplemented May 19, 1989 (RBG-30922). The results of the mid-cycle examinations were submitted to the staff in our letter from Mr. W. H. Odell dated March 21, 1990 (RBG-32527). Three examinations were performed during the third refueling outage. Synopses of each examination are provided in Enclosures 2 and 3. The results of these inspections revealed an increase in flaw length of 1.1 inches, and an increase in flaw depth of 0.13 inches. A chronology of the UT examinations performed on this weld is provided in Enclosure 4. An analysis of the results of the RF-3 UT examinations has been performed by the GE Company and are provided in Enclosure 1.

Inservice Inspections (ISI) were performed in accordance with ASME Code Section XI and Generic Letter 88-01. The augmented inspection conducted at River Bend Station (RBS) during RF-2 identified an indication in the N4A-2 feedwater inlet nozzle to safe end weld. A circumferential indication, as shown in Figure 1 of Enclosure 1, was identified on the safe end weld, in the buttered area. The indication was detected and sized by manual examination to be approximately 6.125 inches long, with a maximum depth of approximately 0.2 inches and an average depth of 0.16 inches. Manual and automatic (P-Scan) ultrasonic examinations were conducted on the N4A-2 nozzle during the cycle 3 mid-cycle

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outage (MCY-3). The results of these inspections revealed no increase in depth of the indication, and the length of the indication had increased 0.5 inches to a total length of 6.625 inches. The manual and P-Scan examinations performed during RF-3 revealed that the indication had grown to a maximum length of 7.7 inches and to a maximum depth of 0.33 inches as shown in Enclosure 2. Figure 2 of Enclosure 1 shows a depth profile of the indication at RF-2 and RF-3.

The nozzle-to-safe end weld received manual and automatic ultrasonic examinations by EBASCO Services Inc. and a manual ultrasonic examination by Hellier Associates during RF-3. These examinations were completed November 11, 1990. Attachment 1 to Enclosure 2 summarizes the methods used by the examiners during their inspections. Below are the findings of each examination performed :

1. Manual Ultrasonic Examination by EBASCO Services Inc.
(Enclosure 2):

The indication was detected and sized to be a maximum of 7.7 inches long, with a maximum depth of approximately 30 percent through-wall (0.33 inches) and an average depth of 15 to 20 percent through-wall (0.165 to 0.22 inches) along the length of the indication with branching effects of measurable depth.

2. Automated Ultrasonic Examination (P-Scan) by EBASCO Services Inc. (Enclosure 2):

The indication was detected and sized to be approximately 6.93 inches long, with a maximum depth of approximately 25 percent through-wall (0.275 inches) and an average depth of 15 to 20 percent through-wall (0.165 to 0.22 inches) along the length of the indication with branching effects of measurable effects.

3. Manual Ultrasonic Examination by Hellier Associates
(Enclosure 3):

The indication was detected and sized to be approximately 7.625 inches, with a maximum depth of approximately 30 percent through-wall (0.33 inches).

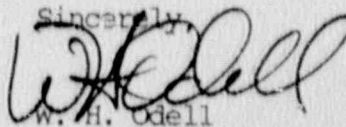
Note: 100 percent through-wall depth is 1.1 inches.

Based upon the results from the aforementioned inspections and evaluations of the examination data sheets, GSU has determined that there was indication growth of approximately 0.13 inches in depth (18 to 30 percent through-wall) and 1.1 inches in length (17.6 to 20.4 percent pipe circumference) since MCY-3.

In accordance with the reporting requirements of Generic Letter 88-01, this evaluation of the subject weld indication and the assessment of growth rate is provided for your review and approval. Because the unit is scheduled for restart November 25, 1990, your prompt attention to this submittal is requested.

If you need any additional information, please contact Mr. Leif L. Dietrich of my staff at (504)381-4866.

Sincerely,



W. H. Odell

Manager-River Bend Oversight
River Bend Nuclear Group

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Attachments

cc: U. S. Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
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This indication exhibits faceting and branching, multiple peaks, short pulse durations, fast rise and fall time, etc., which are indicative of IGSCC. From this determination, GSU is treating the N4A-2 feedwater nozzle-to-safe end weld as an IGSCC Category "F" weld addressed in NRC Generic Letter 88-01. This weld shall be examined under the guidelines set forth in the generic letter and shall be addressed in the RBS ISI Plan.

The RF-2 indication depth and the indication depth based on the RF-3 UT are shown in Figure 6 of Enclosure 1. It is seen that the overall growth in the indication over the past cycle is well below the predictions in the analysis provided in our letter dated May 15, 1989. The predicted indication growth rate, based on the worst case reactor water conductivity, used to determine indication growth during the fourth fuel cycle is 5.0 E-5 in/hr . This valve bounds the growth rate estimated from the MCY-3 and RF-3 UT sizing (2.89 E-5 in/hr). It can be seen that the conservatively estimated flaw size after 7000 hours of operation would be 0.68 inches compared to the ASME Code allowable value of 0.825 inches. Based on the evaluation of the condition, GSU has determined that operation until the mid-cycle outage, scheduled for the latter half of September, 1991 is acceptable in the current condition. In addition to this evaluation, GSU will take the following corrective actions:

1. The subject feedwater nozzle weld will be re-examined during the mid-cycle outage planned for cycle 4. This outage is currently scheduled for approximately 7000 hours of operation after startup from RF-3. This corresponds to the latter half of September, 1991. The results of the mid-cycle examination and evaluation of the data will be provided to the NRC along with descriptions of any further corrective actions. Materials and personnel will be staged to permit repairs to this weld should the mid-cycle measured indication depth and length be found outside the bounds of the analysis.
2. The subject feedwater nozzle weld will also be re-examined during the fourth refueling outage per the requirements of Generic Letter 88-01. This will allow further determination and verification of growth of the indication, if any.
3. GSU is planning to join the recently developed EPRI Nozzle/Safe-End Research Program. This research program addresses the evaluation of repair, replacement, residual stress mitigation and examination approaches for Boiling Water Reactors nozzle to safe-end configurations that use Inconel 182 weld filler materials.

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