

GULF STATES UTILITIES COMPANY

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May 1, 1991
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U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

Gentlemen:

River Bend Station - Unit 1
Refer to: Region IV
Docket No. 50-458/90-27

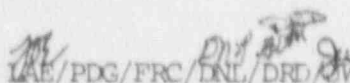
Pursuant to 10CFR2.201, this letter provides Gulf States Utilities Company's revised reply to the Notice of Violation for NRC Inspection Report No. 50-458/90-27. The purpose of this revision is to clarify and redress the understanding regarding the welding program at River Bend Station documented in your letter dated January 25, 1991. The tolerances used by craft welders are a combination of those allowed by the American Welding Society Code D1.1.

Should you have any questions, please contact Mr. L.A. England at (504) 381-4145.

Sincerely,



W.H. Odell
Manager - Oversight
River Bend Nuclear Group


LAE/PDG/FRC/DNL/DRE/DWC/kvm

Attachment

cc: U.S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Driver, Suite 1000
Arlington, TX 76011

Senior Resident Inspector
P.O. Box 1051
St. Francisville, LA 70775

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PDR ADOCK 05000458
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UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

STATE OF LOUISIANA)

PARISH OF WEST FELICIANA)

In the Matter of)

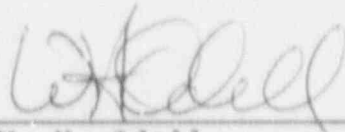
GULF STATES UTILITIES COMPANY)

Docket No. 50-458

(River Bend Station - Unit 1)

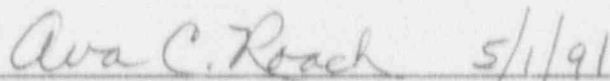
AFFIDAVIT

W. H. Odell, being duly sworn, states that he is Manager - Oversight for Gulf States Utilities Company; that he is authorized on the part of said company to sign and file with the Nuclear Regulatory Commission the documents attached hereto; and that all such documents are true and correct to the best of his knowledge, information and belief.



W. H. Odell

Subscribed and sworn to before me, a Notary Public in and for the State and Parish above named, this 1st day of May, 1991. My commission expires with Life.



Ava C. Roach
Notary Public in and for
East Feliciana Parish, Louisiana
authorized to act in West Feliciana
Parish, Louisiana

ATTACHMENT

REPLY TO NOTICE OF VIOLATION 50-458/90-27 LEVEL IV

REFERENCE

- Notice of Violation - Letter from S.J. Collins to J.C. Deddens, dated October 25, 1990.
- Letter from S.J. Collins to J.C. Deddens, dated January 25, 1991.

VIOLATION

Criterion IX of Appendix B to 10CFR50 states, in part, "Measures shall be established to assure that special processes, including welding, . . . are controlled and accomplished by qualified personnel using qualified procedures in accordance with applicable codes, standards, specifications, criteria, and other special requirements." In the following examples, this did not occur.

1. Section 5.1 of the AWS D1.1 Structural Welding Code exempts from qualification testing (and designates as prequalified) those welding procedures which conform to all of the provisions of the Code including utilization of the specific weld joint designs detailed in Section 2. All other welding procedures are required by Section 5.2 of the Code to be qualified prior to use.

Contrary to the above, WPS-W1.1-01, which was designated as an AWS D1.1 prequalified welding procedure, was utilized in an application where the weld joint details did not conform to the requirements of Section 2 of the Code. Specifically, the joint configuration used for welding the flange to outer plate on a modification to the diesel generator tornado damper separator (Modification Request 86-1389) did not conform to the Section 2 prequalified joint details for included angle, thereby invalidating the procedure as prequalified. It was also determined that General Welding Procedure SPP-7002, Revision 1, which was referenced in WPS-W1.1-01 for joint fitup tolerances was inconsistent with the requirements of Section 2 of the Code; for example, the allowable root opening for Joint A-TC-U4a in SPP-7002 exceeded that permitted by the AWS D1.1 Code for a prequalified joint.

2. Paragraph 6.8.5 of Procedure QCI-3.15, "Visual Welding Inspection ASME, ANSI B31.1," Revision 2, requires that Quality Control verify, on a random basis, the in-process welding for proper technique, cleaning between passes, appearance of individual welding beads, sequence of welding, and use of correct voltage and amperage.

Contrary to the above, Quality Control was neither scheduling nor performing random verifications of in-process welding to ensure that welding conformed to procedural requirements.

REASON FOR THE VIOLATION

1. American Welding Society (AWS) Code D1.1 Paragraph 2.9.2 allows variation on design and detail drawings within the limits specified in Paragraph 3.3.4 of AWS-D1.1. GSU's weld joint details are specified in Attachment 6 of procedure SPP-7002. These details show the total variation allowed by Paragraph 3.3.4 and thus are in conformance with the code requirements.

For the example referenced in the Notice of Violation, joint detail A-TC-U4a has been revised under Revision 2 of procedure SPP-7002 to be designated as joint "TC-U4a" (attached). This detail lists the combined allowable joint variations as:

α = groove angle = 40° to 65°
R = root opening = 0 to $1/4"$
f = root face = NL (not limited)

The AWS D1.1 Code lists for the same joint detail the allowable joint variations (copy attached) as:

Groove prep	As detailed 2.9.2	As fit-up 3.3.4
R = 0 to $1/8$	$+1/16, -0$	$+1/16, -1/8$
f = 0 to $1/8$	$+1/16, -0$	not limited
$\alpha = 45^{\circ}$	$+10, -0$	$+10, -5$

The groove preparation and tolerances when combined provide for the following allowances:

$\alpha = 40^{\circ}$ to 65°
R = 0 to $1/4"$
f = not limited

As can be seen these allowable joint variations are identical to those identified in Attachment 6 of SPP-7002. GSU has identified no inconsistencies in SPP-7002 with respect to AWS D1.1 prequalified weld joint details.

2. GSU Quality Control failed to adequately implement existing procedures involving verification of in-process welding activities. This was primarily caused by infrequent welding activities during plant operation.

CORRECTIVE STEPS WHICH HAVE BEEN TAKEN AND THE RESULTS ACHIEVED

The following actions have been taken to correct the deficiencies identified in the RBS welding program.

- Training on the RBS welding program was developed and conducted for contract welders, QC inspectors and foremen.
- Requirements for weld machine amperage checks have been implemented.
- An in-process weld monitoring QC checklist (QCL-SPC-0010) has been generated.
- QC welding inspectors were instructed concerning procedural requirements for in-process monitoring of welding activities.
- The Operations QC Annual Monitoring Plan has been revised to include "welding" monitoring when welding activities are being performed.
- Procedure SPP-7002 has been revised as Revision 2 and issued to all manual holders on March 28, 1991. The cover sheet identifying the revision and issue date is attached.

CORRECTIVE STEPS WHICH WILL BE TAKEN TO AVOID FURTHER VIOLATIONS

In addition to the actions listed above, the following actions are planned for implementation.

- Procedures will be revised to require independent verification holdpoints.
- A comprehensive six hour welder training program was developed and given during the third refueling outage. This program will be expanded for the fourth refueling outage.

DATE WHEN FULL COMPLIANCE WILL BE ACHIEVED

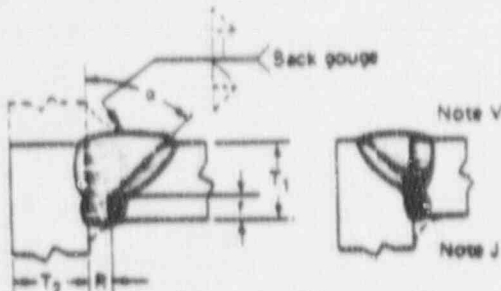
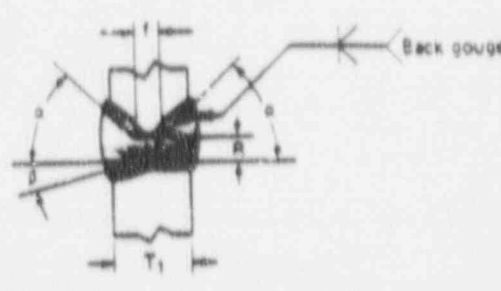
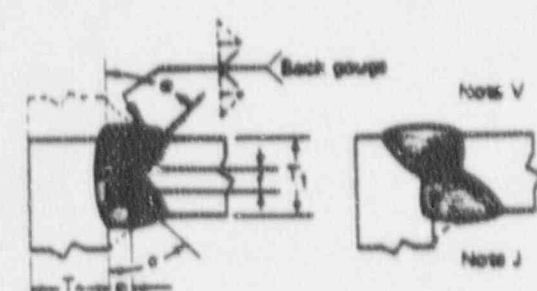
The corrective actions identified above are complete with the exception of procedure revision, and the comprehensive welder training program. These actions will be completed prior to welding during the fourth refueling outage.

ATTACHMENT 8.6

SPECIFIC REQUIREMENTS FOR PREQUALIFIED JOINT - AWS D1.1

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SMAW - COMPLETE PENETRATION WELDS

Notes: C, J, E, F			Position	Notes: C, E, F			Position
$E = 0$ to $1/4$	$w = 40'$ to $65'$		All	$E = 0$ to $1/4$	$w = 45'$		All
$f = BL$				$E = 0'$ to $15'$	$w + E = 40'$ to $60'$		
				$f = BL$			
 <p>TC - U4a</p>				 <p>B - U5a</p>			
Notes: C, J, E, F			Position	Notes:			Position
$E = 0$ to $1/4$	$w = 40'$ to $65'$		All				
$f = BL$							
 <p>TC - U5b</p>				<p>BLANK</p>			

Single bevel-groove weld (A) Butt joint (B)		Base metal thickness (U = unlimited)		Groove preparation		Permitted welding positions	Gas shielding for (FCAW)	Notes
Welding process	Joint designation	T ₁	T ₂	Root opening Root face Groove angle	Tolerances As detailed (see 2.9.2) As fit up (see 3.3.4)			
SMAW	B-U4	U	—	R = 0 to 1/8 f = 0 to 1/8 α = 45°	+1/16, -0 +1/16, -0 +10°, -0°	All	—	C, N
GMAW FCAW	B-U4-GF	U	—		+1/16, -0 not limited +10°, -5°	All	Not required	A, C, N

Single bevel-groove weld (A) T-joint (T) Corner joint (C)		Base metal thickness (U = unlimited)		Groove preparation		Permitted welding positions	Gas shielding for (FCAW)	Notes
Welding process	Joint designation	T ₁	T ₂	Root opening Root face Groove angle	Tolerances As detailed (see 2.9.2) As fit up (see 3.3.4)			
SMAW	TC-U4a	U	U	R = 0 to 1/8 f = 0 to 1/8 α = 45°	+1/16, -0 +1/16, -0 +10°, -0°	All	—	C, J, V
GMAW FCAW	TC-U4a-GF	U	U		+1/16, -0 Not limited +10°, -5°	All	Not req.	A, C, J, V
SAW	TC-L4a-S	3/4 max	U	R = 0 f = 1/8 max α = 60°	±0 +0, -1/8 +10°, -0°	Flat	—	J, V, Y

Note A: Not prequalified for gas metal arc welding using short circuiting transfer. Refer to Appendix D.

Note C: Gouge root to sound metal before welding other side.

Note J: If fillet welds are used in buildings to reinforce groove welds in corner and T-joints, they shall be equal to 1/4 T₁ but need not exceed 3/8 in. Groove welds in corner and T-joints of bridges shall be reinforced with fillet welds equal to 1/4 T₁ but not more than 3/8 in.

Note N: The orientation of the two members in the joints may vary from 135 deg to 180 deg provided that the basic joint configuration (groove angle, root face, root opening) remain the same and that the design throat thickness is maintained.

Note V: For corner joints, the outside groove preparation may be in either or both members, provided the basic groove configuration is not changed and adequate edge distance is maintained to support the welding operations without excessive edge melting.

Note Y: Shielded metal arc, submerged arc, gas metal arc (spray transfer), or flux cored arc backing fillet weld required.

Fig. 2.9.1 (continued)—Prequalified complete joint penetration groove welded joints

2.9 Complete Joint Penetration Groove Welds

2.9.1 Complete joint penetration groove welds made by shielded metal arc, submerged arc, gas metal arc (except short circuiting transfer), or flux cored arc welding in butt, corner, and T-joints which may be used without performing the joint welding procedure qualification test prescribed in 5.2 are detailed in Fig. 2.9.1 and are subject to the limitations specified in 2.9.2.

All complete joint penetration groove welds made by short circuiting transfer gas metal arc welding (see Appendix D) shall be qualified by the welding procedure qualification tests prescribed in 5.2.

2.9.2 Dimensional Tolerances. Dimensions of groove welds specified on design or detailed drawings may vary from the dimensions shown in Fig. 2.9.1 within the limits specified in 3.3.4.

J- and U-grooves may be prepared before or after assembly.

2.9.3 Groove preparations detailed for prequalified shielded metal arc welded joints may be used for prequalified gas metal arc or flux cored arc welding.

2.9.4 Joint Root Openings. Joint root openings may vary as noted in 2.9 and 2.10. However, for automatic or machine welding using flux cored arc, gas metal arc, and submerged arc welding processes, the maximum root opening variation (minimum to maximum opening as fit-up) may not exceed 1/8 in. (3.2 mm). Variations greater than 1/8 in. shall be locally corrected prior to automatic or machine welding.

2.9.5 Corner Joints. For corner joints, the outside groove preparation may be in either or both members, provided the basic groove configuration is not changed and adequate edge distance is maintained to support the welding operations without excessive melting.

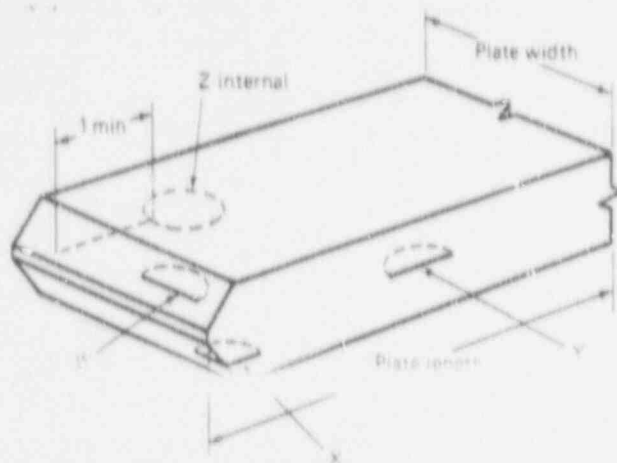


Fig. 3.2.3.3—Edge discontinuities in cut plate

The fillet and its adjacent cuts shall meet without offset or cutting past the point of tangency.

3.2.5 Machining, air carbon arc cutting, oxygen cutting, oxygen gouging, chipping, or grinding may be used for joint preparation, back gouging, or the removal of unacceptable work or metal, except that oxygen gouging shall not be used on steels that are ordered as quenched and tempered or normalized.

3.2.6 Edges of built-up beam and girder webs shall be cut to the prescribed camber with suitable allowance for shrinkage due to cutting and welding. However, moderate variation from the specified camber tolerance may be corrected by a carefully supervised application of heat.

3.2.7 Corrections of errors in camber of quenched and tempered steel must be given prior approval by the Engineer.

3.3 Assembly

3.3.1 The parts to be joined by fillet welds, shall be brought into as close contact as practicable. The root opening shall not exceed $3/16$ in. (4.8 mm) except in cases involving either shapes or plates 3 in. (76.2 mm) or greater in thickness if, after straightening and in assembly, the root opening cannot be closed sufficiently to meet this tolerance. In such cases, a maximum root opening of $5/16$ in. (8.0 mm) is acceptable provided a backing weld or suitable backing⁶ is used. If the separation is $1/16$ in. (1.6 mm) or greater, the leg of the fillet weld shall be increased by the amount of the root opening

or the contractor shall demonstrate that the required effective throat has been obtained.

The separation between faying surfaces of plug and slot welds, and of butt joints landing on a backing, shall not exceed $1/16$ in. (1.6 mm). The use of fillers is prohibited except as specified on the drawings or as specially approved by the Engineer and made in accordance with 2.4.

3.3.2 The parts to be joined by partial joint penetration groove welds parallel to the length of the member, bearing joints excepted, shall be brought into as close contact as practicable. The root opening between parts shall not exceed $3/16$ in. (4.8 mm) except in cases involving rolled shapes or plates 3 in. (76.2 mm) or greater in thickness if, after straightening and in assembly, the root opening cannot be closed sufficiently to meet this tolerance. In such cases, a maximum root opening of $5/16$ in. (8.0 mm) is applicable provided a backing weld or suitable backing⁶ is used and the final weld meets the requirements for effective throat.

3.3.2.1 Tolerances for bearing joints shall be in accordance with the applicable contract specifications.

3.3.3 Parts to be joined by groove welded butt joints shall be carefully aligned. Where the parts are effectively restrained against bending due to eccentricity in alignment, an offset not exceeding 10% of the thickness of the thinner part joined, but in no case more than $1/8$ in. (3.2 mm), shall be permitted as a departure from the theoretical alignment. In correcting misalignment in such cases, the parts shall not be drawn into a greater slope than $1/2$ in. (12.7 mm) in 12 in. (304 mm). Measurement of offset shall be based upon the center line of parts unless otherwise shown on the drawings.

3.3.4 With the exclusion of electroslag and electrogas welding, and with the exception of 3.3.4.1 for root openings in excess of those permitted in the table below and illustrated in Fig. 3.3.4, the dimensions of the cross section of the groove welded joints which vary from those shown on the detail drawings by more than the following tolerances shall be referred to the Engineer for approval or correction.

	Root not gouged*		Root gouged	
	in.	mm	in.	mm
(1) Root face of joint	$\pm 1/16$	1.6	Not limited	
(2) Root opening of joints without steel backing	$\pm 1/16$	1.6	+1/16	3.2
Root opening of joints with steel backing	+1/4	6.4	-1/8	3.2
	-1/16	1.6	Not applicable	
(3) Groove angle of joint	+10 deg		+10 deg	
	-5 deg		-5 deg	

*See 10.13.1 for tolerances for complete joint penetration tubular groove welds made from one side without backing.

6. Backing may be of flux, glass tape, iron powder, or similar materials; by means of shielded metal arc welding root passes deposited with low hydrogen electrodes, or other arc welding processes.

Root openings wider than those permitted in 3.3.4, but not greater than twice the thickness of the thinner part or 3/4 in. (19 mm), whichever is less, may be corrected by welding to acceptable dimensions prior to joining the parts by welding. Root openings larger than the above may be corrected by welding only with the approval of the Engineer.

3.3.5 Grooves produced by gouging shall be in accordance with groove profile dimensions as specified in Figs. 2.9.1 and 2.10.1.

3.3.6 Members to be welded shall be brought into correct position and held in position by bolting, clamps, wedges, guy lines, struts, and other suitable devices, or by tack welds until welding has been completed. The use of jigs and fixtures is recommended where practicable. Suitable allowances shall be made for warpage and shrinkage.

3.3.7 Tack Welds

3.3.7.1 Tack welds shall be subject to the same quality requirements as the final welds except that

(1) Preheat is not mandatory for single-pass tack welds which are remelted and incorporated into continuous submerged arc welds.

(2) Discontinuities such as undercut, unfilled craters, and porosity need not be removed before the final submerged arc welding.

3.3.7.2 Tack welds which are incorporated into the final weld shall be made with electrodes meeting the requirements of the final welds and shall be cleaned thoroughly. Multiple-pass tack welds shall have cascaded ends.

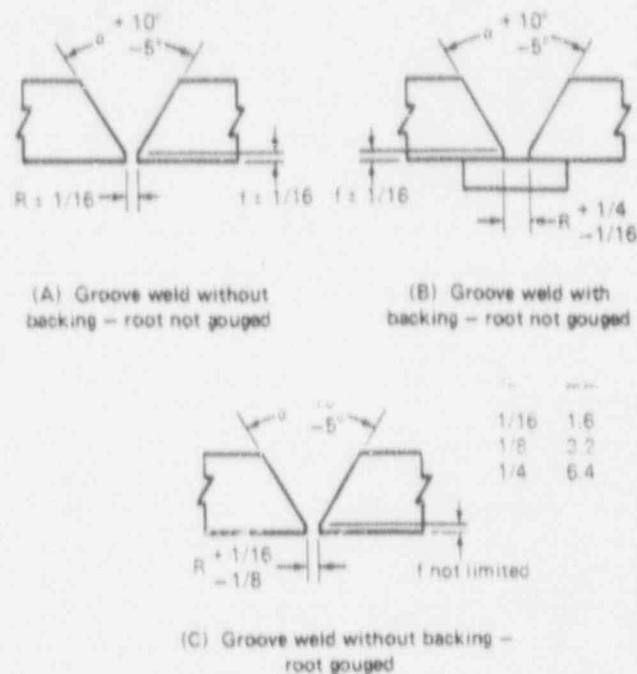
3.3.7.3 Tack welds not incorporated into final welds shall be removed, except that for buildings they need not be removed unless required by the Engineer.

3.4 Control of Distortion and Shrinkage

3.4.1 In assembling and joining parts of a structure or of built-up members and in welding reinforcing parts to members, the procedure and sequence shall be such as will minimize distortion and shrinkage.

3.4.2 Insofar as practicable, all welds shall be made in a sequence that will balance the applied heat of welding while the welding progresses.

3.4.3 The contractor shall prepare a welding sequence for a member or structure which, in conjunction with the joint welding procedures and overall fabrication methods, will produce members or structures meeting the quality requirements specified. The welding sequence and distortion control program shall be submitted to the Engineer, for information and comment, before the start of welding on a member or structure in which shrinkage or distortion is likely to affect the adequacy of the member or structure.



Notes:

1. α - groove angle.
2. R - root opening.
3. f - root face.
4. The groove configurations shown are for illustration only.

Fig. 3.3.4—Workmanship tolerances in assembly of groove welded joints

3.4.4 The direction of the general progression in welding on a member shall be from points where the parts are relatively fixed in position with respect to each other toward points where they have a greater relative freedom of movement.

3.4.5 Joints expected to have significant shrinkage should usually be welded before joints expected to have lesser shrinkage. They should also be welded with as little restraint as possible.

3.4.6 All shop splices in each component part of a cover-plated beam or built-up member shall be made before the component part is welded to other component parts of the member. Long girders or girder sections may be made by shop-splicing subsections, each made in accordance with this paragraph.

3.4.7 In making welds under conditions of severe external shrinkage restraint, the welding shall be carried continuously to completion or to a point that will ensure freedom from cracking before the joint is allowed to cool below the minimum specified preheat and interpass temperature.

GENERAL WELDING PROCEDURE FOR AWS

SPP-7002

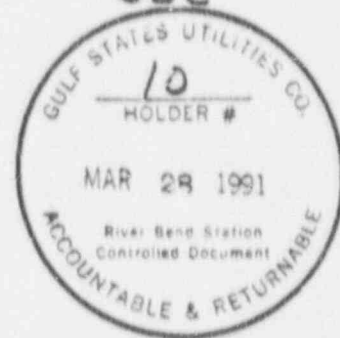
REVISION 2

RECEIVED

MAR 27 1991

SDC

RIVER BEND STATION - UNIT 1
GULF STATES UTILITIES COMPANY
ST. FRANCISVILLE, LOUISIANA



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Maintenance Engineering - Welding
Engineer

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Date

CC Bann
Supervisor - Maintenance Engineering

3/27/91
Date

William K. Anderson / FOR
Supervisor - Quality Engineering

3/27/91
Date