



**GULF STATES UTILITIES COMPANY**

POST OFFICE BOX 2951 • BEAUMONT, TEXAS 77704

AREA CODE 713 838-6631

May 25, 1984

RBG- 17,929

File Code G9.5, (9.8.6.2

Mr. Harold R. Denton, Director  
Office of Nuclear Reactor Regulation  
U.S. Nuclear Regulatory Commission  
Washington, D.C. 20555

Dear Mr. Denton:

River Bend Station - Unit 1

Docket No. 50-458

Enclosed for your review is Gulf States Utilities Company's (GSU) supplemented response to Question 210.101 concerning minimum wall thickness at girth butt welds from the Nuclear Regulatory Commission's (NRC) Mechanical Engineering Branch (MEB) consultant to Oak Ridge National Labs, E.C. Rodabaugh Associates, Inc. This response will be provided in a future amendment to the River Bend Station Final Safety Analysis Report.

Sincerely,

for J. E. Booker  
Manager-Engineering  
Nuclear Fuels & Licensing  
River Bend Nuclear Group

JEB/RJK/je

Enclosure

*Booker  
1/10*

8406040206 840525  
PDR ADOCK 03000438  
A PDR

210.101 In your Specification No. 228.000, "Specification for Piping Engineering and Design", Revision 1, dated 3/15/81 including Addenda 1 and 2, you have addressed the minimum allowable wall thickness at girth butt welds in piping. You have stated that the minimum wall thickness at girth butt welds is established by the counterbore requirements and it will be found on analysis that this value will not decrease to less than the manufacturer's minimum wall thickness requirements. Using a 12 inch schedule 160 pipe as an example you have provided the following example:

Sketch	STD-SP-1056-15
Pipe O.D.	12.719 in. (including 1/32 in. tolerance)
Pipe I.D.	10.126 in.
"C" Bore (per sketch)	10.423 in. (including 0.010-in. tolerance)
Final wall thickness	$(12.719 - 10.423)/2 = 1.148$ in.
$(0.875)t_n$	$(0.875)(1.312) = 1.148$ in.

The use of C-dimensions as illustrated by your example, in conjunction with a pipe specification that has a tolerance of (minus)  $-1/32$ " on outside diameter (such as SA-106), would assure  $t_m \geq (7/8)t$ ; provided the counterbore is concentric with respect to the minimum outside diameter ( $t_m$  = minimum wall,  $t_n$  = nominal wall). If you do not control concentricity of the counterbore, explain how you are assured that  $t_m \geq (7/8)t_n$ . Include in the explanation consideration of 1) ANSI B16.9 fittings, 2) pipe specification SA-155, and 3) any other specification you use for ASME Code piping at River Bend which does not have the same minus tolerance on outside diameter as SA-106.

#### RESPONSE

With some exceptions, for ASME Section III pipe with 26 in. and larger OD, the Stone and Webster Engineering Corporation Specification 228.150, Rev. 1, entitled "Shop Fabricated Piping" does not provide a specific minimum wall thickness or counterbore dimension. However, the specification requires the pipe ID be maintained at the nominal OD minus  $2t$  with a tolerance of  $\pm 1/32$  in. Where specific dimensions are given they were developed based on the methods described in PFI Standard ES-1, "End Preparation and Machined Backing Rings for Butt Welds". The calculations used to develop these counterbore and minimum wall dimensions include the tolerances given in the material specification (SA-155) except for out-of-roundness and off-center counterboring. However, as a guard against violation of required minimum pipe wall thickness the pipe fabricating is not allowed to violate the material specification minimum wall requirement unless specific approval is obtained from the engineers.

Insert A

Insert B

In addition to the above, the SWEC Specification 228.150, Rev.1, Page 1-54 requires the Sellers Quality Control Representative (EQCR) to certify that minimum pipe wall thickness is not violated. As such the pipe

Insert A

...and that materials be provided in accordance with the applicable ASTM or ASME material specification.

Insert B

It is understood by SWEC shop inspectors that when reference is made to a minimum wall thickness requirement for pipe that this thickness check shall be based on the minimum thickness specified in the material specification unless the engineer specifies ASME III Code  $t_m$  (Equation 1).

fabricator measures the actual wall thickness on all ends counterbored for field welding and records these readings on its shop traveler.

← Insert C

Addendum No. 2 to Specification 228.150, Rev.1 ties Specification 228.150 back to design Specification 228.000. Refer to Addendum No. 2 Page 1-3.

A discussion is provided in new Section 3.9.1.7A.

Insert C

To provide clarification to the requirements of the specification the last sentence of "C" under item 19 of the inspection criteria will be changed to read,

"Certify that the material specification minimum wall thickness requirements have not been violated."

### 3.9.1.7A Piping Engineering and Design

A quality control representative witnesses, on a surveillance basis, the dimensional checks to ensure that the counterbore of pipe is in accordance with the specification and that minimum pipe wall thickness ← Insert D has not been violated. In order to assure records on actual field end counterbores performed by the shop fabricator, the fabricator includes on his shop traveler the required and actual counterbore dimension as well as the required and actual pipe wall thickness after counterboring.

The preliminary stress analysis of Class 1 piping systems is based on the assumption that the out-of-roundness is within 0.08t limit that is specified in Table NB-3681(a)-1 of ASME Section III. Technical justification for these assumptions are described as follows:

- (1) While the out-of-roundness tolerances, established by ASME Code and piping specifications, are not sufficient to assure the 0.08t limit, the pipes are judged to be generally round (i.e., within the 0.08t limit to require no increase of k-index).
- (2) Out-of-roundness affects only the pressure term in the calculation of peak stresses. Its contribution to the overall peak stresses are not significant even if out-of-roundness conditions permitted by the design/fabrication specifications is considered.

Final Class 1 pipe stress analysis are reviewed to account for out-of-roundness based on the fabrication limits established by the ASME Code and pipe specification, unless more realistic field measurements are available.

Insert D

... the material specification minimum pipe wall thickness requirement...

S & W P.O. # RBS-228-150-084  
 S & W J.O. # 12210  
 REF. ISOMETRIC DRAWING NO. 1-SWP-002  
 S&W CL 151

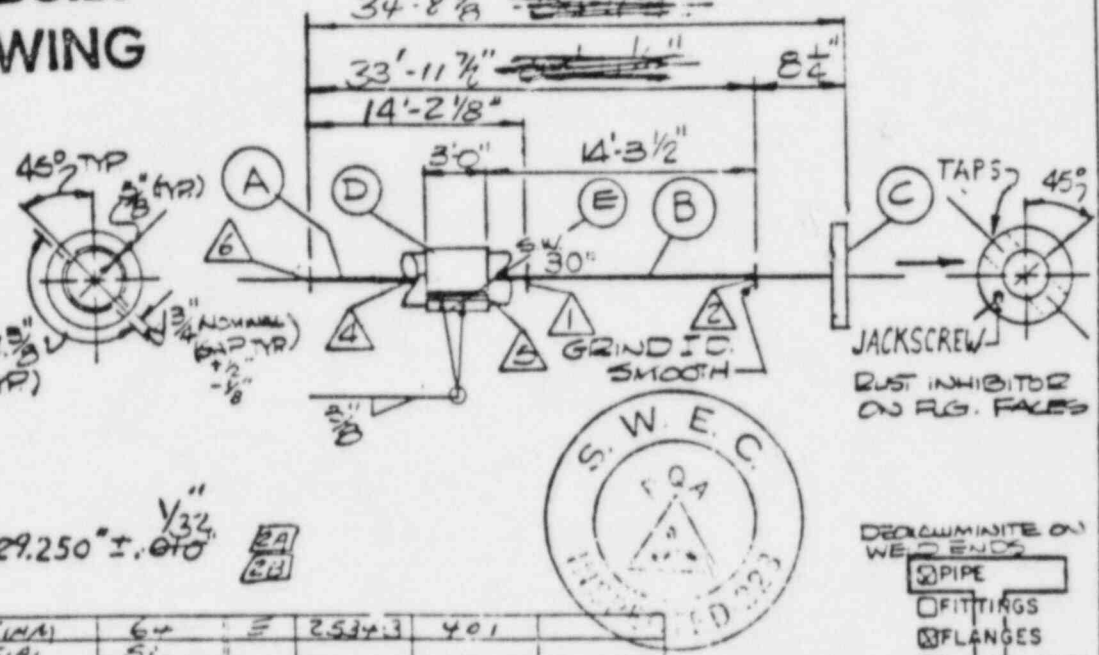
Enclosure 1 (cont'd.)

\*\* ATTACH NAME DATE  
 TO FABRICATION  
 3

SHIP ORDER NUMBERS	
SHAW	S & W
1	1-SWP-002-SW-007
2	1-SWP-002-SW-008
4	-086
5	1-027

# AS BUILT DRAWING

Gulf States Utilities Co.  
 River Bend Station, Unit 1  
 RBS-228-150-084  
 Shop Fabricated Piping  
 Shaw Co., Laurens, S.C.  
 S.S. Job #9408



"C" = 29.250" ± .010  
 1/32"  
 2A  
 2B

ITEM	P.O. NO.	HEAT NO.	TUBE	WT.	ITEM	P.O. NO.	HEAT NO.	TUBE	WT.
A	6929-4	E1A1	6"	25343	401				
B	6929-3	E1A1	5"						
C	249-1	1B899							
D	2534-3	401							

WT. 6050

- DECALUMINATE ON WELD ENDS
- PIPE
  - FITTINGS
  - FLANGES
  - FILLER MATL
  - ATTACHMENTS

CUSTOMER: STONE & WEBSTER ENGR. FOR GULF STATES UTILITIES CO. RIVER BEND STATION UNIT #1  
 BENJ. F. SHAW CO. WILMINGTON, DELA. LAURENS, SC TUSCALOOSA, ALA.  
 9408 SWP 1011  
 FAB MARK NO. 1-SWP-025-3-011 REC'D 1

FABRICATE AT: <input checked="" type="checkbox"/> LAURENS <input type="checkbox"/> TUSCALOOSA	PREHEAT: POSTHEAT: WELDS: BENDS:	SKETCH ISSUE NO. CUTTING LIST NO. <input checked="" type="checkbox"/> TRAVELER SIGN-OFF REQ'D <input type="checkbox"/> SUPP TESTS REQ'D *	NONDESTRUCTIVE EXAMINATION <input type="checkbox"/> RADIOGRAPHY <input checked="" type="checkbox"/> MAG PARTICLE <input type="checkbox"/> LIQUID PENT <input type="checkbox"/> ULTRASONIC
FABRICATE PER: <input checked="" type="checkbox"/> ASME SECT. III CLASS 3	WELDING PROCEDURE NO'S MANUAL MACHINE BRANCH ATTACHMENT	AUTHORIZED INSP. REQ'D. <input checked="" type="checkbox"/> 150 PSIG <input checked="" type="checkbox"/> 125 OF	<input type="checkbox"/> SAND <input type="checkbox"/> GRIT <input type="checkbox"/> SHOT BLAST <input type="checkbox"/> 10 <input type="checkbox"/> 00
WELD END PREPS 9408-57			CLEANING SP-CL-1 REV-3 PAINTING NONE

STOCK CODE NO.	CARBON STEEL MATERIAL	REQ'D	BASE	ADD'L	UNIT	TOTAL
01						
02	30"-STD WT PIPE SA-155 CL-1 G-5E	342'				
03	30"-300# RFW N ORIF FLG (STD BORE) SA-105 (PER MSS-SP-44) (W/JACKSCREW)	1				
04						
05	30"-U-BEVEL END PROT (SEALED)	1	RMVZ	065371		
06	30"-300# FLG PROT (SEALED)	1	RMVZ	065374		
07			RMVZ	1562		
08			RMVZ	065374		
09			RMVZ	065374		
10			RMVZ	065374		
11	ASME NAME DATE					
12	*(END MACH'D PER 9408-30(29.250" ± .010)*)					
13	ASME SECT III, CL 2 MAT'L					
14	3'-0" LG X 4 1/2" DIA X 1/2" THK FLG (PER SPEC. 31.1)					
15	DET 9408-41 DET HAA-7) SA-515 G-255					
16						
17						

REV. 1  
 CLS# 240 NO 12210-EP103FHX 6  
 DETAL NO SWP-101

DOCUMENT CONTROL



